Theses and Dissertations   1. Thesis and Dissertation Collection, all items

2013-12

Military compensation in the Armenian Armed Forces: life cycle cost model for the Armenian Army

zurLippe, Jan-Hendrik C.

Monterey, California: Naval Postgraduate School

http://hdl.handle.net/10945/39044

NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

MILITARY COMPENSATION IN THE ARMENIAN ARMED FORCES: LIFE CYCLE COST MODEL FOR THE ARMENIAN ARMY

By: **Jan-Hendrik C. zurLippe**

December 2013

Advisors: **Diana Angelis,**
                 Robert M. McNab

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE		*Form Approved OMB No. 0704–0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202–4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704–0188) Washington DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE December 2013	3. REPORT TYPE AND DATES COVERED MBA Professional Report
4. TITLE AND SUBTITLE MILITARY COMPENSATION IN THE ARMENIAN ARMED FORCES: LIFE CYCLE COST MODEL FOR THE ARMENIAN ARMY		5. FUNDING NUMBERS
6. AUTHOR(S) Jan-Hendrik C. zurLippe,		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943–5000		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A		10. SPONSORING/MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number ____N/A____.		
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited		12b. DISTRIBUTION CODE

13. ABSTRACT (maximum 200 words)

 The Armenian Armed Forces is moving from a conscript force to a volunteer force. They are based on a soviet-era military structure, but are attempting to adopt a Western-style of force structure, similar to the U.S. and U.K. A key element in this is the establishment of a professional NCO corps within the Armenian Army. As they seek to develop the senior enlisted ranks, as well as move to an all-volunteer force, they have identified the need to re-evaluate their current military pay and compensation structure. This must all be done with an eye toward long-term personnel costs, which is currently not happening.

This project developed a cost model to examine the various life cycle costs of the military compensation system for the Armenian Army. The focus is on the structure of the Armenian Army peacekeeping brigade and incorporates the new, proposed professional NCO corps into a new rank and pay structure. The model allows the Armenians to adjust criteria to look at the cost implications of various manpower policy decisions. It also provides total compensation costs on an annualized basis, allowing policy makers to make informed budgeting decisions. The results show the costs at different manpower and rank mixes.

14. SUBJECT TERMS Armenia, life cycle cost model, PKB, NATO IPAP, professional NCO corps			15. NUMBER OF PAGES 111
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU

NSN 7540–01–280–5500

Standard Form 298 (Rev. 2–89)
Prescribed by ANSI Std. 239–18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

MILITARY COMPENSATION IN THE ARMENIAN ARMED FORCES: LIFE CYCLE COST MODEL FOR THE ARMENIAN ARMY

Jan-Hendrik C. zurLippe, Major, United States Marine Corps

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
December 2013

Authors: Jan-Hendrik C. zurLippe

Approved by: Diana Angelis

                  Robert M. McNab

                  William R. Gates, Dean
                  Graduate School of Business and Public Policy

iii

THIS PAGE INTENTIONALLY LEFT BLANK

MILITARY COMPENSATION IN THE ARMENIAN ARMED FORCES: LIFE CYCLE COST MODEL FOR THE ARMENIAN ARMY

ABSTRACT

The Armenian Armed Forces is moving from a conscript force to a volunteer force. They are based on a soviet-era military structure, but are attempting to adopt a Western-style of force structure, similar to the U.S. and U.K. A key element in this is the establishment of a professional NCO corps within the Armenian Army. As they seek to develop the senior enlisted ranks, as well as move to an all-volunteer force, they have identified the need to re-evaluate their current military pay and compensation structure. This must all be done with an eye toward long-term personnel costs, which is currently not happening.

This project developed a cost model to examine the various life cycle costs of the military compensation system for the Armenian Army. The focus is on the structure of the Armenian Army peacekeeping brigade and incorporates the new, proposed professional NCO corps into a new rank and pay structure. The model allows the Armenians to adjust criteria to look at the cost implications of various manpower policy decisions. It also provides total compensation costs on an annualized basis, allowing policy makers to make informed budgeting decisions. The results show the costs at different manpower and rank mixes.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

AMD   Armenian Dram
DOD   Department of Defense
DRMI   Defense Resources Management Office
EUCOM   U.S European Command
GAO   Government Accountability Office
IPAP   International Partnership For Peace
LCC   life cycle cost
MEB   Marine Expeditionary Brigade
MOD   Ministry of Defense
NATO   North Atlantic Treaty Organization
NCO   non-commissioned officer
NMS   national military strategy
NPV   net present value
NSS   national security strategy
ODC   Office of Defense Cooperation
OMB   Office of Management and Budget
PKB   peace keeping brigade
PPP   purchasing power parity
SDR   strategic defense review
TSP   thrift savings plan
USMC   United States Marine Corps

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

I would like to thank my advisors, Professors Diana Angelis and Bob McNab, for their constant guidance and direction throughout the entire process of working on this MBA project. I would also like to thank my wife, Mary Beth, for her constant love and support throughout this arduous process.

THIS PAGE INTENTIONALLY LEFT BLANK

I.   INTRODUCTION

Armenia is a former Soviet republic, located in south-central Asia. Since its independence from the former Soviet Union, the Republic of Armenia has strived to work with the North Atlantic Treaty Organization (NATO) in transforming its military to a more Western model. Part of this transformation involves the move from conscription to a volunteer force, and development of a professional non-commissioned officer (NCO) corps. As the Armenian Armed Forces has progressed in this transformation, it has come to realize that it needs to modernize its service members' pay and benefits, and further understand all the manpower costs involved over the long term.

This project will develop a life cycle cost (LCC) model of pay and benefits for the Armenian Army's peacekeeping brigade (PKB). Armenia has partnered with NATO, and supports its peacekeeping operations with a deployable military unit, the PKB. The Armenian Army is starting with the PKB in its efforts to develop a professional NCO corps and develop a manpower structure that follows that of a best practices Western model (U.S. and U.K.). Through the development of a manpower LCC model for the PKB, this project hopes to help Armenia understand the cost implications of its manpower decisions, as well as how these costs affect budgeting decisions.

The LCC model will calculate the total LCCs for staffing the PKB. To demonstrate the relevance of both current and deferred costs to overall costs, this model will project the costs over a 40-year period. This period will include 20 years of active duty pay and benefits, as well as 20 years of retirement pay benefits. An additional LCC model will also project the current, annualized costs of the deferred retirement pay and benefits a service member earns over a 20-year career. This provides the current and deferred pay and benefits needed to properly budget these costs each year.

Due to the limited manpower and cost data available from the Armenian Armed Forces for this project, this model will include many assumptions based off of Western military models (U.S. and U.K.). These assumptions are documented throughout the model, and can easily be changed to accommodate updates or changes to the specific

1

information. The model also contains user-selectable inputs to allow for easily adjusting the data to different scenarios.

U.S. European Command (EUCOM) and the Defense Resources Management Institute (DRMI) are working with the U.S. Embassy's Office of Defense Cooperation (ODC) in Armenia to advise and support the Armenian Ministry of Defense (MOD) in its military reform efforts and standardization with NATO. A move to a more Western military model will further U.S. strategic interests in the central Asia region, hopefully increasing stability in the region. This project contributes to those efforts.

II. ARMENIA

A. BACKGROUND

Armenia is a country not often generally studied in the Western world. As a former Soviet Republic, its military is modeled after the old Soviet model. To understand the country better, and the impact of the history of Armenia on the current compensation system, this chapter briefly reviews the recent history of Armenia.

The Republic of Armenia is located in the caucus region of central Asia (Figure 1). It is a land-locked nation, surrounded by the following countries: Turkey to the west, Georgia to the north, Azerbaijan to the east and Iran to the south.

Figure 1.   World Map showing Armenia (from World Map-Armenia, n.d.)

Armenia has a current population of approximately 3 million, and its land area is similar in size to the state of Maryland. The terrain is Armenian highland with mountains and little forest land. The climate is also considered highland, with hot summers and cold winters. The largest lake in the Lesser Caucuses Mountains, Lake Sevan, is entirely

within the borders of Armenia. The official language is Armenian, and the country 's religious base is almost exclusively Christian, with approximately 95% identified as Armenian Apostolic ("The World Factbook: Armenia," n.d.).

B.   ARMENIAN HISTORY

Armenia's recent history has been dominated by both the Ottoman and Russian empires. On many occasions, the Armenians attempted to unite, but remained separated because of various political party interests. To provide some background and context on factors that have influenced and shaped Armenia, this chapter will briefly look at some important events that shaped Armenian history.

The Treaty of 1639 was one of the key early events in modern Armenian history, as it brought over a century of war and fighting to an end. Armenia was divided into Ottoman and Persian rule, and it was' not until 1828 that Russia annexed Persian Armenia, shifting the eastern portion of Armenia from Persian imperialism to a more Russian/Western democratic influence. The two Armenia's remained at odds for the rest of the 19th century. Towards the end of the19th century, the failings of both the Ottoman and Russian systems led to the emergence of many revolutionary political parties. By 1892, one of those political parties, the Armenian Revolutionary Federation (ARF), called for a more democratic government in all of Armenia. Among the many common elements one would expect in a democratic government, the ARF also pushed for military service based on conscription, which still remains today (Libaridian, 2004).

Early in the 20th century, the Russian government started to institute an anti-Armenian policy in eastern Armenia, leading to the Armeno-Tatar Conflict from 1905–1907. Then in 1914, the militant faction of the Committee of Union and Progress (CUP) led the Ottoman empire into war. The Turks led a campaign of "Armenian genocide," the massacre and deportation of over a million ethnic Armenians from western Armenia. Russian rule in the Caucasus deteriorated as well, and by 1918, all three Russian territories in the region (Georgia, Armenia and Azerbaijan) claimed their independence (Libaridian, 2004).

The independence of the Republic of Armenia was short-lived. The new Republic of Armenia attempted to gain control over Western Armenia, which was still under Turkish rule. The challenge would turn out to be too great, and in 1920 the Republic of Armenia collapsed. By 1921, the land of Western Armenia returned to Turkish control, while the former Republic of Armenia in the east was taken over by the newly formed Soviet Union (Libaridian, 2004).

The views on the Soviet control of Armenia have varied greatly, from saving the nation, to a form of slavery, and many variations in between. A key benefit for Armenia was the industrialization occurring within the Soviet Union during this time. Armenia had the highest rate of economic production of any Republic within the Soviet Union. It also had a high number of skilled and educated workers. Many of these skilled laborers were living outside Armenia. By the 1970's, over one million ethnic Armenians lived outside of Armenia. They were mainly concentrated in other areas of the Middle East, Europe and the Americas (Libaridian, 2004).

Many factions within Armenia, including the ARF, continued to push for an independent Armenia, free from both Russian and Turkish control. During the Cold War period, these sentiments toward independence became more anti-Soviet. By 1998, the Armenian National Movement (ANM) had started to challenge the communist party in government, seeking Armenian independence. By 1990, the ANM had gained control of the government in Soviet Armenia. They immediately started instituting democratic reforms, and realized that independence was required for democracy. As part of these reforms, military conscripts were allowed to stay and serve in Armenia, not other regions of the Soviet Union (Libaridian, 2004).

Following the collapse of the Soviet Union, Armenia focused its efforts on democratization and state building. Regionally, Armenia has developed and maintained relationships with Russia and Iran, while still maintaining a closed border policy with Turkey and Azerbaijan. Internationally, Armenia has sought to expand its relationships with the U.S. and the European Union to foster democratization, trade, and to balance its regional security interests. When looking at where Armenia is headed, it is helpful to focus on three key elements of national power: diplomatic/political, economic and

military. Before addressing these individually, a discussion of the Nagorno-Karabakh conflict will set the stage for much of Armenia's national strategy.

1.   The Nagorno-Karabakh Conflict

One of the first major events to shape Armenia's independence was the Nagorno-Karabakh conflict. This started as a border dispute with its neighbor and fellow former Soviet Republic, Azerbaijan, over the ethnic background of its people. The conflict had such a great impact on Armenia, that it cut across all three national elements of power to be discussed here: political, economic, and military.

Ethnic Armenians predominately inhabited the Nagorno-Karabakh region, within the territorial boundary of Azerbaijan (Figure 2). During the years leading up to the Soviet breakup, the region voted to move from Azerbaijani to Armenian control in 1988 (Caspersen, 2013). The dispute for control of this region led to fighting between Armenia and Azerbaijan, which started in 1988 while both were still Soviet Republics. This continued while they both gained their independence from the former Soviet Union, finally coming to a cease-fire in 1994. The struggle to reunify with Armenia gradually changed into a struggle for independence for Nagorno-Karabakh. This de facto independence became a reality with the cease fire in 1994. This is similar to what has occurred in other areas of the former Soviet Union and communist-bloc countries, to include Kosovo, Abkhazia, South Ossetia. Though only a cease fire, it was the Armenians who had won this military conflict, providing a strategic advantage. (Papazian, 2008).

Figure 2.   Map of Armenia and Nagorno-Karabakh (from N. MKHRTARYAN, n.d.)

Contrary to what is often recounted, the conflict was not triggered by top-down politics, but by grass roots movements. Hate narratives were common tools used by those involved. The immediate outcome of the conflict was a depressed economy in Armenia well into the late 1990s (Libaridian, 2004). Many people left the area, especially the young and educated (De Waal, 2003). The ultimate results were displaced people and closed borders, continuing a period of depressed economic conditions for Armenia.

This conflict also provided Armenia an opportunity to build up its military from the meager remnants of the old Soviet military. Armenia seized Azerbaijani military weapons and equipment as it won battles during the conflict (Papazian, 2008). This, along with Russian military aid, allowed Armenia the opportunity to grow its own military under the old Soviet model.

The recognition of Kosovo as an independent state by many of the Western powers, in 2008, set a precedent that has emboldened the leaders of Karabakh. Though

initially this bolstered their cries for an independent state, they have since temporarily given up on this recognition, instead pursuing the continued status quo of unrecognized independence (Caspersen, 2013). The longer they can maintain this status quo, the greater chance they will later have for de facto independence later on.

To date, the conflict has not been resolved, though many attempts have been made to come to some sort of agreement between Armenia and Azerbaijan. Occasionally, small incidents occur along the borders and contested areas, which further heighten tensions and make resolution elusive. The distrust between the two nations continues to this day.

2.   Diplomatic/Political

Under the Armenian National Movement (ANM) Armenia was politically stable for many of its early years of independence (Papazian, 2008). By 1995, it had adopted a national constitution by general referendum. This provided for a liberal democracy based off of a Western model. Though Armenia was moving toward a more Western model, the continued distrust of political parties remained. This eventually led to the development of many smaller, though less influential, political parties (Libaridian, 2004).

The Nagorno-Karabakh conflict also influenced the political process. There were many political-military ties in Armenian government. Many movements sought to tie economic reforms with those that served in the Nagorno-Karabakh conflict (Papazian, 2008). The ensuing political battles led to change in political leadership in 1998.

In 2009, Turkey and Armenia reached an agreement to try to normalize diplomatic relations and reopen the border, known as the Turkish Armenian Protocols. This normalization between Turkey and Armenia would aid both economically, as well as politically. In the end, it failed. For progress to occur, Turkey wanted linkage to a resolution of the Nagorno-Karabakh conflict favoring Azerbaijan, since they have close ties to Azerbaijan, while Armenia wanted Turkey to recognize Turkey's involvement in the ethnic Armenian genocide of 1917. Neither happened.

Turkey wanted Azerbaijan to regain control of NK, while Azerbaijan would not agree to recognize a specific timeline for the NK people to vote for independence. Turkey and Armenia seemed to reach for too many concessions from the other side, instead of trying an incremental approach. Now, both sides are trying to reach interim steps to more stabilize the region as continued non-resolution would risk renewed fighting (Welt, 2013).

To this day, charges of political corruption continue in Armenia. Many political parties pulled out of the recent presidential election as a protest to the claimed, corrupt election process. Because of this, it is no surprise that, in 2013, NGO Freedom House rated Armenia as "partly free" in terms of political rights and civil liberties. In context, it rates Azerbaijan and the Nagorno-Karabakh region as "not free" (Nichol, 2013).

3. Economic

The free-market economy system, on the other hand, was popular from the start (Libaridian, 2004). Armenia currently trades with Russia and Iran. To improve its economy, it needs to open its borders with Turkey and Azerbaijan and resume trade and economic activity. Two reasons Armenia suffers economically, which it has little control over, are that it is landlocked with no seaports, and it has relatively few natural resources. Russia has taken advantage of this by manipulating energy supplies and prices in the Caucasus. During the 2000's, Russia gained a virtual control over Armenia's energy supplies, requiring Armenia to maintain favorable ties with Russia. Again, this shows the need for improved relations and trade with Turkey and Azerbaijan.

4. Military

Armenia was able to build its national army due to high national morale, the security threat perceived from Azerbaijan, and the backing and support of Russia (Papazian, 2008). They were able to accomplish this even during tough economic times. Armenians were overrepresented in the Soviet army, so once they declared independence, many came back to serve in Armenia's army (Papazian, 2008).

In 1992, Armenia joined the Commonwealth of Independent States Collective Security Treaty, which included Russia and many other former Soviet Republics. This organization provided mutual security and aid for its member states. In 2002, this organization morphed into the Collective Security Treaty Organization (CSTO). A key provision of the CSTO was that Russia would maintain two military bases in Armenia, leaving over 3,000 Russian troops in Armenia and continuing military ties to Russia (Nichol, 2013).

In 1994, Armenia and Russia reached an agreement where Russia would provide troops to help Armenia guard its borders with Turkey and Iran (Papazian, 2008). In 2010, Russia and Armenia agreed to extend their basing of troops agreement to 2044. As part of this agreement, Russia also agreed to help ensure Armenia's national security and provide modern weapons and military equipment.

C. NATO INVOLVEMENT

1. Background

Armenia has chosen an association with NATO as its best opportunity to further its goals of a modern, democratic government and military. This relationship started soon after its independence from the former Soviet Union. In 1992, Armenia joined what is now known as the Euro-Atlantic Partnership Council (EAPC). Then in 1994, Armenia joined the Partnership for Peace (PfP). According to the EUCOM website, the PfP program "aims to enhance cooperation and stability in central and eastern European countries while increasing interoperability between partner nations and NATO." They go on to describe why countries decide to partner with NATO, " The core objectives PfP nations pursue are creating transparency in national defense planning and budgeting processes; ensuring democratic control of defense forces; developing interoperable forces and command and control structures; and preparing partner nations to contribute to NATO operations" (EUCOM Public Affairs, n.d.).

Armenia's National Security Strategy goes on to explain the importance of Armenia's participation in the PfP program. The Armenian government believes it is

critical to not only develop relationships with the NATO-member nations, but to further integrate itself as part of Europe (Gevorkyan, n.d.).

That brings up an interesting point: that Armenia is trying to further integrate into Europe, yet currently has no plans to actually join NATO. This may be its attempt to develop and maintain the best possible relationships with two seemingly opposite sides: the Western powers (specifically the U.S.) and Russia.

2.   International Partnership Action Plan

To further develop relationships with NATO, Armenia signed its first International Partnership Action Plan (IPAP) agreement with NATO in 2005. An IPAP is an agreement between NATO and a country, not yet a member, to further align political, democratic, economic and military goals. According to NATO's website, "such plans are designed to bring together all the various cooperation mechanisms through which a partner country interacts with the Alliance, sharpening the focus of activities to better support their domestic reform efforts" ("NATO - Individual Partnership Action Plans (IPAPs)," n.d.). The purpose of the IPAP is for the partner country (Armenia) to set clear reform objectives and priorities. NATO will then provide advice and guidance in helping the partner country achieve those objectives. Another benefit of an IPAP is that the partner country agrees to standards of interoperability among all the NATO nations. This makes assistance and unilateral operations much easier to execute.

The most current NATO-Armenian IPAP covers 2011–2013 ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). The objectives covered fall into four major areas: 1) political and security related issues, 2) defense and military issues, 3) public information, science, environment and civil emergency planning issues, and 4) administrative, protective security and resource issues. Of interest are the objectives that pertain to and guide this project. There are six different objectives identified in the IPAP with direct relevance.

Objective 2.3 calls for the conduct and implementation of a Strategic Defense Review (SDR) ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). This is critical in setting the ground work for reform of the Armenian Armed Forces.

Armenia successfully published its SDR in 2011 (Ministry of Defense, 2011). The SDR covers the period from 2011–2015. The SDR takes guidance from Armenia's previously issued National Security Strategy (NSS), from 2007, as well as their Military Doctrine, which is similar to what the U.S. would call a National Military Strategy (NMS). The SDR allows the Armenian government to focus its military efforts on the ever-changing political and security landscape the country faces.

Objective 2.4 focuses on defense budgeting and planning ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). Not only is Armenia taking a long-term outlook when it comes to planning their budgets, but they are going to focus on a more holistic method of determining all relevant costs- the life cycle cost methodology. This project will apply the life cycle cost model to the military compensation system for the Armenian Army's Peacekeeping brigade.

This leads to the next objective, 2.6.1, which calls for Armenia to establish a Peacekeeping Brigade using NATO standards ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). The standardization allows interoperability with other NATO partners and member nations. This Peacekeeping Brigade will ultimately be able to deploy a battalion-sized unit, with support elements, in support of NATO operations.

Within objective 2.7.1, one of the tasks calls for Armenia to develop a professional NCO Corps ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). This reform is a direct move away from the old, soviet-style military and towards a Western-style military, similar to the U.S. and UK. Determining the right size and shape of this NCO Corps will be important in determining total military compensation, and ultimately, life cycle costs.

The reform of the military's personnel management system is reflected in objective 2.7.3 ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). Key elements of this include aligning military pay with rank, time in service, time in grade, and appropriate qualifications. Retired military pay and benefits is also addressed. Including these costs will be crucial in developing a life cycle cost model.

Finally, objective 2.7.5 calls for establishing a trust fund for expected costs for transitioning retired military personnel ("NATO Individual Partnership Action Plan 2011–2013: Armenia," n.d.). These costs differ from retirement benefits, as they cover programs aimed at transitioning back into the civilian sector.

THIS PAGE INTENTIONALLY LEFT BLANK

III. MODELS OF MILITARY STRUCTURE

A. ARMENIA

Not only is the Armenian military looking to move to a Western model, but Russia is as well (Pan, 2009). This movement is as much by necessity as it is by choice. When the Soviet Union fell, both countries were forced to look at a more democratic model of government, and how that new political system would influence the control and structure of the military.

B. SOVIET MILITARY

The end of the cold war removed the threat of nuclear war, forcing a natural change for the structure of the new, now Russian, government and military. Prior to the collapse of the Soviet Union, the military revolved around centralized leadership. Looking back to the 1960's, Soviet military officer training and education was heavily focused on science and technology (Rice, 1987). Condoleezza Rice, in her study of the former Soviet Union, noted that this caused a decrease in officer proficiency on military matters. By the 1970's, the Soviet Union refocused its officer corps on the study of military history to increase war fighting proficiency.

The Soviet military lacked civilian staff in its military structure. Whereas the U.S. DoD runs a parallel civilian structure at the senior level of DoD leadership, alongside senior military leaders, no such system existed in the Soviet system. The civilian oversight of the soviet military rested at the top of the organization, in what the Soviet's called the Defense Council. They provided oversight and strategic direction. The Ministry of Defense was staffed with military officers and served as the general staff for the Soviet military. This organization was concerned with the day-to-day operations of the Soviet military (Rice, 1987). This disconnect would pose problems as Russia looked to moved toward a democratic system of government after the fall of the Soviet Union.

1. Soviet Military Personnel Structure

The old Soviet military structure was based on conscripted service, like many other nations. This system of required military service for young men evolved as Russia absorbed the old Soviet structure and made it its own. The length of time that conscripts serve has decreased incrementally over the years, from two years down to now one year ("Morale," 2013).

Since the downfall of the Soviet Union, the Russia military has made attempts to move to more of an all-volunteer force, as well as develop the professional NCO corps amongst its enlisted ranks. One of the largest obstacles in developing the professional NCO corps has been the negative attitude and culture among officers toward the enlisted soldiers. The officers in the Russian military have long looked down on enlisted soldiers with contempt, treating them as a lower class. This stems from the old communist rule in the Soviet Union (Golts & Putnam, 2004).

The efforts to stifle reform in the Russian military can be traced back to senior level military and government officials in Moscow. Though many possible reasons for the lack of reform exist, the most plausible seem to be the lack of adequate budgetary resources available for the Russian military, and the stubborn, communist mentality still evident in many of the older leaders in Moscow. Though Russia has made improvements recently, especially in military pay, the reform efforts still have a long way to go (Gorenburg, 2011).

2. Russian Armed Forces Pay and Compensation

At first look, Russian military officers and soldiers seem to be inadequately compensated for their service. Upon further inspection, the total compensation is hard to actually identify, as there are numerous types of pays and bonuses. Kier Giles does an excellent job of taking a closer look at all these pays. He details how the Russian military pay system can be broken down into (3) distinct pays: 1) rank pay, 2) duty pay, and 3) additional pays and bonuses (Giles, 2007).

The Russian military has 20 different ranks across both officer and enlisted ranks. This roughly correlates to most Western models, such as the U.S. and UK. Whereas most

Western models use rank to determine a large percentage of overall pay compensation (generally two-thirds or more), this portion of overall pay for a Russian officer or soldier is much less (as little as 5%). There have been improvements and reforms to Russian pays more recently (Gorenburg, 2011) but a classic example of the wide disparity can be seen in the base pay of a Private. Under the older Russian pay system, the base pay for Private was about 400 out of a total monthly pay of about 9000 Rubles (Giles, 2007). In comparison, a private in the U.S. Army receives a base pay of about $1500 out of total monthly pay compensation of around $2300 (DFAS, n.d.). As one can see, looking at a pay table by rank will tell a very different story when comparing Russian military pay to Western models.

The duty pay becomes more complicated, and the largest source of pay compensation. Duty pay includes a portion for time in service, as well as a portion that depends upon the billet the soldier is currently serving in or the level of command for an officer. The duty pay also depends upon whether the soldier is a conscript or a contracted professional soldier. Conscript soldiers only have 6 levels of duty pay, whereas a contract soldier has 50 different levels (Giles, 2007). Duty pay is a larger percentage of total pay than rank pay.

The additional pays and bonuses can range from special pays for performing certain dangerous events, like parachuting and diving, to extra pay for serving on the MoD central staff in Moscow. One of the more subjective pays is a yearly bonus for performance that most soldiers receive. This pay is determined at the local commander's level, and the system of determining this has often been fraught with corruption. One soldier can often receive up to 10 additional pays and bonuses, making up the majority of his pay compensation (Giles, 2007).

The Russian military pay system is prone to inequality and lack of transparency (Giles, 2007). Often, soldiers at the same rank, even in the same job, can have vastly different total compensation because of the numerous subjective pays. When it becomes difficult to see and understand the true monetary compensation earned by a soldier, problems with transparency arise. It becomes difficult to properly budget for manpower costs when it is not fully understood what all those costs are. Not only are the manpower

costs difficult to accurately budget for in each year, but military planners will find it difficult to properly manage the size of the force going forward. Full comprehension of their total manpower and personnel costs will allow them to better shape their force for the future.

When it comes to retirement, officers have typically been given apartments or houses as their retirement benefit. In recent years, this has been jeopardized as fiscal issues in Russia have caused the government to delay or even forgo providing this retirement benefit. Some officers that are receiving housing upon retirement are getting old, dilapidated military base housing on closed (or scheduled to be closed) bases (Pan, 2009).

All the problems the Russian military faces with the old Soviet-style personnel structure has finally led to some attempts at reforms. At the end of 2011, the Russian government began to reform the Russian military pay structure (Gorenburg, 2011). Not only does this increase the transparency of its pay structure, but it also improves the competitiveness of military pay with the civilian sector.

C.   WESTERN-STYLE   MILITARY   STRUCTURE   AND   PAY COMPENSATION

In looking to Western military pay and compensation models, there are many benefits that make it appealing to those states still under the former soviet model. As mentioned earlier, transparency and equity are two very important aspects of a pay compensation system that are lacking in the old Soviet-style pay and compensation system.

In a technical paper on *Best Practices in Military Compensation*, the authors look at competing theories on military compensation, from institutional and market perspectives (Angelis & McNab, 2012). An institutional perspective allows for comparability of compensation across those with the same rank and skill set. This becomes difficult under the old soviet model, as the numerous and varied pays across even the same rank provide varying total compensation. The lack of transparency in not only the pays available, but also in how they are determined, makes comparability

difficult. This also applies to the concept of horizontal equity, where those of similar rank and jobs receive approximately the same pay. A market perspective relies on the forces of supply and demand to determine pay for different occupations in different areas, as well as competing with the civilian workforce. From a this perspective, the old Soviet military pay system does align better, as their duty pay is dependent upon the type of job and the location where it is performed.

When looking at best practices in a total military compensation model, there are generally four basic elements included:

- Basic military pay: includes basic pay, food and housing allowances.
- Special and incentive pay: includes pay for hazardous duties, as well as bonuses for serving in certain jobs.
- Non-monetary benefits: includes healthcare, education and base services.
- Deferred compensation: includes retirement pay and benefits.

This structure for pay and benefits has been successfully implemented by the U.S. and UK. Though there are some differences, both nations have effectively applied the principles of transparency and equity, along with a balance from both the institutional and market perspective.

U.S. Military basic pay compensation consists of base pay, housing and food allowances. Base pay is based on rank and years of total service. A pay chart is published each year showing the amounts of pay. The housing allowance is based on rank, whether the service member has dependents or not, and the duty station location. This list is updated annually. The food allowance is one portion of the U.S. compensation system that does not provide for any vertical equity. There is one rate for officers, and one rate for enlisted service members. The rate for enlisted is actually higher than the rate for officers. This can be traced back to a law that was never updated, which actually is meant to pay for feed for an officer's horse.

There are numerous special and incentive pays, but an individual will normally only qualify for one or two at the same time, if any at all. These pays can be attributed to performing special or critical jobs, or serving in hazardous duty locations. Many of them are based on rank or length of service relative to performing the specific job. The breadth

and details of all these pays go beyond the scope of this project. Important to understand is the fact that these tie into the market approach to compensation, allowing the military to compete with the civilian sector for critical skills (Angelis & McNab, 2012).

The non-monetary current benefits are provided to service members regardless of rank, as there is no reasonable way to justify basing these on rank or any other criteria. These include healthcare, education benefits, and various base support services.

The main component of deferred compensation is retirement pay. Retirement pay is determined by rank and years of service. The other key component is retired healthcare coverage. Like coverage while on active duty, this benefit is the same, regardless of rank.

The UK Military pay and benefits compensation system is similar to the system in the U.S.; however, there are (2) key differences: 1) determining basic pay, and 2) determining retirement compensation. In the UK, base pay is calculated based on rank and service within that rank, not total time in service. The enlisted ranks also are divided into two separate pay bands, with those requiring a higher level of technical proficiency paying more. There is also no separate line item for housing or food allowances, as in the U.S.. These items are included in base pay ("Army Pay Scales," n.d.).

IV. COST CONCEPTS

This chapter will expand on the military pay and compensation structures discussed in the previous chapter. The focus will be on cost concepts relevant to developing a life cycle cost (LCC) model. As the Armenian military moves to a more Western model, a useful LCC model can serve as a tool to analyze the cost implications of manpower decisions. The LCC model will support the recent strategic defense review (SDR) initiative as well as facilitate future force structure and manpower decisions.

A. LCC MODEL

1. General Description

What are life cycle costs? Simply stated, life cycle costs are all the costs incurred over the life of an item or program. Costs most often occur at different points in time throughout the item's or program's lifetime. To compare these various costs at a single point in time, usually the present, analysts use a technique called discounting (discounting will be discussed later in this chapter). Discounting LCCs allow decision makers to compare alternatives based on the present value of all the costs. The initial costs usually involve producing, procuring or purchasing the item. Additional costs occur, either regularly or irregularly, throughout the lifetime to operate and maintain the item. At the end of its lifetime, there are usually costs involved in disposing or dismantling the item, and then getting rid of it and its support structure.

LCC models are often developed as part of a larger cost/benefit analysis, which goes beyond just costs to include quantifiable and non-quantifiable benefits as well. A key feature of a LCC model is that it only provides an estimate, and that estimate is only as good as the data and assumptions used to develop it (NATO, 2007). LCC models go on to develop a life of their own. They need to constantly evolve with updated information to stay relevant and useful (GAO, 2007).

The LCC model in this project provides the Armenian Army a means to begin to understand all the manpower costs associated with staffing their PKB. As they continue on to refine the cost data, validate or change assumptions and refine their organizational

structure and staffing, the LCC model will become more useful and accurate. They should then be able to conduct analyses of alternatives on a greater scale in the future.

2.   How LCC Models are Developed

The approach to developing a LCC model is similar to that of other projects. A basic four-step approach can be used to develop LCC models. The following section will describe these four steps and how they apply to the LCC model for this project (NATO, 2007).

a.   *Define the Aim and Objective of the Project or Study*

This needs to be clearly stated from the outset and understood by all stakeholders involved. In this project, the scope of LCC model was confined to the Armenian Army PKB. The objective was to try to measure the relevant pay and benefits associated with the manpower choices made by military planners.

b.   *Establish Cost Structure, Content and Assumption*

It is important to clearly define the cost elements which will be used in the LCC analysis. Time may limit the amount or detail of cost elements that can be gathered and analyzed. For areas where content or data is not available, the analyst needs to make assumptions in order to continue with the analysis. The analyst needs to try to validate the assumptions throughout the process of developing the LCCs. The more assumptions that can be validated, the more accurate the outcome of the LCC model will be.

This project broke down the cost elements to into a manageable number of cost categories, including current pay and benefits, as well as deferred pay and benefits. The addition of the professional NCO corps for the Armenian Army increased the number of enlisted ranks into the pay scale. Since the actual staffing and cost data available from the Armenian Army was limited, many assumptions on the actual pays and value of benefits were used. Because of the limited duration of this project, no further updates to assumptions were available.

c. Develop the Structure of the LCC Framework

A model can be a simple spreadsheet or an advanced technique such as a simulation or linear programming. The LCC model should be designed so that it takes user inputs, and through interaction with the cost elements and assumptions, converts them to a usable output. The model should be tested to ensure that the equations and formulas produce repeatable and correct results. Sensitivity analysis can later test how changes in the assumptions affect the outcome. The structure of the LCC model for this project is detailed in the next chapter and sensitivity analysis is presented in the following chapter.

d. Determine the Data and Populate the Life Cycle Cost Framework

The data must be gathered, from whatever source available and then assumptions used where accurate data is not available. These are then placed into the LCC model framework to allow the model to calculate the outcome. The next chapter details the data and assumptions used for the LCC model in this project.

3. Military Application

The US Department of Defense (DOD) defines life cycle costs for a program as the "sum of four major cost categories, where each category is associated with sequential but overlapping phases of the system life cycle." (Cost Analysis Improvement Group, 2007). The four major categories that comprise the life cycle costs are (Cost Analysis Improvement Group, 2007):

- Research & Development: These costs are self-explanatory, yet can vary wildly. If a new concept or item is being developed, these costs will be large. If the program consists of acquiring existing technology or items, these costs will be relatively small.

- Investment: These costs cover the production and/or acquisition costs of the item.

- Operating & Support: Theses costs run for the life of the item or program and include the on-going costs to operate and maintain the item or program. These costs are often the largest portion of life LCCs.

- Disposal: Any costs to get rid of the item or program fall into this category. Often there is a salvage value that can be recouped that can offset some of these costs.

So how does military pay compensation fit into these cost categories for military programs? There is no easy and exact answer. The key is to try and relate costs associated with manpower into a model that is normally used for large programs, equipment and gear. The following costs for manpower can be associated with each category:

- Research & Development: Since the military incurs no costs prior to the initial recruiting of service members, there would be no manpower costs associated with this category.

- Investment: This would cover the costs to recruit and provide initial accession training (basic training and initial skills training). Recruiting costs are reduced under a conscription type of service, as compared to an all-volunteer force, as the advertising costs would not be incurred, only the costs to process the new joins. These costs are beyond the scope of the LCC model developed in this thesis.

- Operating & Support: This is where the majority of manpower costs occur. All current pay compensation (cash and non-cash) are included in this category. Deferred retirement benefits are budgeted, based on anticipated retirements, and included here as well.

- Disposal: Separations pay and benefits can be considered disposal costs, as these pay and benefits are necessary to transition the service member out of the service. This would include payments to those separated from the service prior to being eligible for retirement benefits.

Since the Armenians currently do not use a LCC model to look at their overall costs, using a LCC model will help the armed services improve force planning and resource allocation. To further understand their total manpower costs, they will need to breakdown their manpower costs into the different elements of military compensation. These elements are further described in later sections.

B. DISCOUNTING

When comparing LCC models for different alternatives, it is very likely that the timing and amount of the cash flows will differ between alternatives. This poses a problem, since differences in the timing of cash flows can result in different opportunity costs and risks, even if the total of the cash flows is identical. In general, there is a

preference for deferring cost which means a dollar today is worth more than a dollar in the future, often described as the "time value of money".

This preference for deferring costs can be quantified using a discount rate[1] to calculate the total amount in today's dollars that is equivalent to the future cash flows, also known as the Net Present Value (NPV) of the cash flows. The formula for calculating the present value of future cash flows is given by the following equation:

$$P = F_n(1+i)^{-n}$$

where F_n = future value in period n
$\qquad$ P = present value
$\qquad$ i = discount rate
$\qquad$ n = number of periods

When the NPV of the LCC model is computed, the amount is known as the discounted LCC.

A key benefit of using a discounted LCC model is the ability to compare various alternatives (items, programs, manpower, etc) with differing cash flows. The model accomplishes this by discounting all the costs, which span various lengths of time, to 2013. This provides comparison across alternatives using 2013 dollars. NPV can also be used to compute the equivalent annuity (equal payments over a period of years) that is required to fund retirement benefits in the future. The annuity is included in the compensation model to account for the cost of retirement benefits in the current budget.

C.   PURCHASING POWER PARITY

The foreign exchange rate, or market exchange rate, is used to convert one country's currency to that of another. According to the IMF (Callen, 2012), purchasing power parity (PPP) is "*the rate at which the currency of one country would have to be converted into that of another country to buy the same amount of goods and services in*

---

[1] In the private sector, the cost of capital is often used as the discount rate. This is the rate of return that the entity can get on its money for the next best alternative investment. In the US government, the Office of Management and Budget (OMB) ("Circular A-94 Appendix C | The White House," 2012) publishes yearly guidance on the discount rates. These updates direct federal agencies on the current discount rates to use in their cost analysis.

each country". The two concepts are very closely related, and sound very similar, yet each has a distinct application.

The market exchange rate is appropriate for financial transactions and flow of money across international borders. It is effective in exchange calculations on internationally traded goods, but it is inherently volatile over the short-term due to market and government actions.

On the other hand, PPP provides long-term stability of exchange rates. It also more accurately measures non-traded goods and services when comparing low-income versus high-income nations. PPP can be calculated at every economic level, from an individual product all the way up to the GDP of a nation. To further understand PPP, the World Bank ("What are PPPs?," 2011) explains that when looking at the national GDP PPP between countries, it is not based off of the exact same products and services in both countries. The aggregate of goods and services will be different, based off of economic, social and cultural differences, but they will still provide a comparable level of satisfaction and utility. The downside is that PPP is statistically intensive and much harder to measure. As a result, it is not updated/recalculated as frequently as the market exchange rate, which is continuously updated. It is also not available for all nations, which would then require estimation.

In this paper, PPP is used to convert military pay from US dollars (USD) to Armenian Dram (AMD) for three reasons: 1) it is more stable over time, and 2) Armenia is a much lower income nation than the US, and 3) the PPP exchange rate for the US/Armenia is available.

D.   COSTS FOR POLICY DECISIONS

A concept often not fully understood by military planners is that changes in manpower policies have direct cost implications. Planners will often be so focused on their area of expertise (ex. manpower) that they fail to consider the impact those changes have on other areas (ex. costs). Part of the problem for them is they do not know how their policy decisions affect costs. Since they do not understand it, it becomes easier to just ignore the costs in their entirety.

The discounted LCC model is a relevant and appropriate tool that planners can use when analyzing the cost implications of their policy decisions. The discounted LCC model allows planners to examine various alternatives across a mix of different inputs. Manpower planners can more readily see the costs associated with different mixes of personnel or levels of staffing. The model created in this project will allow the Armenian Army to look at the cost implications of different mixes of ranks, as well as overall size, within the PKB.

E.   COSTS FOR BUDGETING DECISIONS

LCC models can also provide assistance in budgeting over extended periods of time. As part of the data collection process in building the LCC model, the analyst collects various costs and data. These costs come from different periods of time throughout the life cycle. The costs for each specified period of time (ex. year) can be aggregated and included into a budget for that period of time. This enables those involved in planning budgets to get realistic costs for inclusion in the planning of spending for future years. Note that for budgeting purposes an undiscounted LCC is appropriate, since we are interested in the actual cash flows required in each year of the budget.

F.   COST OF MILITARY COMPENSATION

In developing the discounted LCC model, part of the consideration is what elements of military compensation to include. The previous chapter briefly introduces some of the elements of military compensation used by Western, best-practice models. In its simplest form, military compensation can be broken down into cash and non-cash (in-kind) benefits. Those benefits can be further categorized as either current or deferred compensation. For the Armenian MoD, understanding the discounted LCC costs associated with the PKB is important for viable force planning and the efficient allocation of defense resources.

Many of these costs can be debated, and have been, by other sources (Asch & Warner, 1994), (Goldberg, 2012). Of particular interest, and worth some extra discussion here, is how the deferred benefit of retirement pay is often seen as a necessary element of overall military compensation. In an effort to reduce personnel costs over the years, the

US government has often analyzed whether it even needs to offer retirement pay as part of the overall military compensation package (Goldberg, 2012). The opportunity to reduce or eliminate deferred compensation not only saves money for the government in the near term, but reduces the uncertainty that is inherent in paying benefits at an unknown point in the future.

In an effort to reduce total compensation costs, there have been many agencies and commissions that have looked at either changing the military retirement system from a defined-benefit plan to a defined-contribution plan, or totally doing away with retirement pay (Goldberg, 2012). A defined-benefit retirement system pays the retiree a specified amount, or benefit, in retirement. The financial risk is focused on the benefits provider, as that organization assumes the current and future costs for those benefits. This is the current retirement system in place for the US military. A defined-contribution plan shifts the burden of financial risk of future retirement costs to the employee. The employee contributes to the plan while working, and receives the benefits of the growth and return of the underlying investment later in retirement. In the private sector, most companies provide some sort of matching contributions to what the employee contributes. The US military adopted the Thrift Savings Plan (TSP) in 2001 (Goldberg, 2012), a defined-contribution retirement plan. The intent was to offer those military members not serving 20 or more years the opportunity to save for retirement. The services have the authority to offer matching contributions, but currently none do (Goldberg, 2012).

The question is often asked whether the military still needs a defined benefit retirement system, especially since businesses in the civilian sector have greatly reduced the use of these types of retirement systems, in favor of less costly defined-contribution systems. The military system, in most Western models, is hierarchical with little opportunity for lateral entry (exception for medical professionals). This means that almost all entrants into military service must come in at the very bottom, whether enlisted or officer, and get promoted to move up. With no real lateral entry, an incentive is needed for service members to stay for a career in the military. The current defined-benefit military retirement system, as found in the US model, provides that incentive.

If the US military changed to a defined-contribution system, similar to most of the private sector, there would need to be additional incentive for service members to stay long-term. Without the additional incentive to stay, like vesting, many service members could easily take the education and training offered by the military, along with their "portable" defined-contribution plans, and move to the private sector to continue their careers. Without the requirement for vesting of government contributions, the service member could simply withdraw it, let it continue to grow, or transfer it to another retirement plan if they decide to leave the military. Though the in-depth discussion of defined-benefit versus defined contribution retirement plans is beyond the scope of this project, this brief introduction provides the reader with a basic understanding of how the costs affect total military compensation.

This chapter reviewed the concepts of life cycle costs, discounted life cycle costs, and the application of these concepts to manpower costs. If manpower costs are not accounted for across the life cycle, then it is likely that policy decisions will be biased in favor of costs deferred into the future. Furthermore, a lack of discounting implies a constant time value of money, that is, manpower costs today and in the future are equivalent. This next chapter develops a life cycle cost model for the Armenian Army PKB and examines the sensitivity of these costs to changes in assumptions.

THIS PAGE INTENTIONALLY LEFT BLANK

V.   LIFE CYCLE COST MODEL FOR THE PKB

A.   INTRODUCTION

The purpose of this project is to provide the Armenian Armed Forces a life-cycle cost (LCC) model that shows the cost implications (total pay and benefit compensation) of manpower policy decisions for the staffing of the Peacekeeping Brigade (PKB) over a 40-year period. This model will show the costs for a 20-year period of use (the manpower staffing of the PKB), and then the follow-on period of 20 years of retirement benefits for those eligible for a military retirement. The life-cycle period was chosen based on the average length of service for an individual plus the expected length of retirement for an individual. This approach explicitly recognizes that the Armenian government incurs both active duty and retirement costs when it chooses to operate the PKB. Understanding this will allow the Armenian Armed Forces to further develop their focus on program budgeting, not only for manpower compensation, but all programming and budgeting aspects throughout their armed forces.

To further aid in developing program budgeting, this project also develops a compensation cost model that shows total compensation (current and deferred) annualized over the career of both enlisted and officer ranks. Whereas the LCC for the PKB focuses on the manpower costs for the unit, the annual compensation model attributes compensation costs to the individual. This will allow the Armenian Armed Forces to scale the compensation analysis to much larger units and organizations, even service-wide.

Both of these models will provide the Armenians relevant analysis in which to make different decisions. The LCC model will show the cost implications of manpower policy decisions. This should benefit Armenian military planners, as the connection between policy decisions and costs is often not made. The annual compensation model, which shows current and deferred costs and benefits by year, provides the costs that need to be budgeted for it that particular year. This will aid the Armenians as they move from a cash accounting system to an accrual-based system.

B.   DATA

The model allows the user to make a few basic adjustments to staffing inputs to determine the LCC. The data used in computing the LCC is determined through various means: input from the Armenian Armed Forces, U.S. (DFAS, n.d.) and UK ("Army Pay Scales," n.d.) military pay models, and professional judgment.

C.   TOTAL MILITARY COMPENSATION

At the core of this model is understanding all the pay and benefits that go into determining a service member's overall military compensation (see appendix A). This is composed of monetary and non-monetary compensation. These pay and benefits were broken-down far enough to get clarity on the types of pay and benefits that need to be considered, but not so far as to make the model overly complicated or confusing. In determining the types of pay and allowances for military compensation, a look at best practices identifies three basic parts: 1) cash/monetary, 2) in-kind benefits, and 3) deferred benefits (Angelis & McNab, 2012).

1.   Cash/Monetary Benefits

The most recognized and visible portion of military compensation is pay and allowances. These monetary benefits consist of basic pay, food allowances, housing allowances, special pay, bonuses and other pay.

a.   *Basic Pay*

Basic Pay is the largest portion of military compensation. For this model, data for actual Armenian ranks and pay charts were unavailable. As the Armenian Armed Forces are moving to a best-practices military compensation model similar to the U.S. and UK, this model provided a great opportunity to propose a new rank structure similar to the UK Army rank structure for both officer and enlisted (The British Army, 2013). The Armenians prefer a pay chart that favors time in rank over time in service when calculating base pay at each rank, which is a key differentiator between the U.S. and UK military pay scales. The British Army pay charts (see Appendices B & C) were the starting points for converting to a new Armenian Army pay chart (see Appendices D &

32

E). Since this model develops the LCC's for the Armenian Army PKB, the British Army rank structure and pay chart is the most applicable comparison for developing the recommended new Armenian Army rank and pay structure. All pay charts contain annual pay amounts.

(1)   Officer Rank & Pay Chart. The new officer rank structure for the Armenian Army mirrors the current UK system (British Army). For this model, the ranks go from O-1 to O-7. For the PKB, the senior billet is the Brigade Commander. This level of command is at the O-7 (Brigadier) rank in the UK, which is different from the U.S. military model, where a Brigade Commander is typically an O- 6 (Colonel). Of note is that this disparity also occurs at the Company Commander level, where in the UK Army rank structure, an O-4 (Major) is typically a Company Commander, whereas in the U.S. model it is an O-3 (Captain). These differences are most likely due to the difference in size of each country's armed forces, but do not affect any calculations within the model itself.

The British Army Officer pay scale adjusts pay by rank and time in grade (that particular rank). The base pay increases for each additional year spent at that rank. The British pay scale refers to those increases in pay at a particular rank as a "level." Since there will be many soldiers at the various officer ranks throughout the PKB, the model does not need to be complicated by accounting for every possible level of pay within a rank. This model will use the median level from each officer rank, as taken from the British Army pay scales, in determining the basic pay portion of the total compensation. This means there will be only one pay assigned to each officer rank when converting base pay from the British system.

(2)   Enlisted Rank & Pay Chart. The new enlisted rank structure for the Armenian Army should include the proposed new ranks for the professional NCO corps. This model integrates these new ranks for the professional NCO corps (Squad NCO, Platoon NCO, Company NCO) using the current British Army enlisted pay scale, which has only seven enlisted ranks. In order to allow easier future integration/comparison with the U.S. military enlisted pay scales, if needed, the new proposed pay scales for the Armenian Army cover nine ranks (E-1 to E-9). Based off the

level of responsibility of the current British enlisted ranks, and how the new professional NCO corps fits into that, the additional two ranks/pay grades are integrated at the bottom of the pay scale. This creates two separate pay grades for Private (E-1, E-2), and two separate pay grades for Lance Corporal (E-3, E-4). For simplicity sake, this model does not create a new name for the new pay grades. That can be done at a later time if the Armenian Army so chooses.

The British Army Enlisted pay scale adds another differentiator for pay, beyond the levels for time in grade. Occupational specialties are broken down into two categories: higher spine and lower spine. Occupational specialties that fall into the higher spine are those that require greater technical expertise, as determined by the British Army, while the remainder of occupational specialties fall into the lower spine. Pay in the higher spine is more than the lower spine. The U.S. equivalents to the UK higher and lower spine pay bands are the various special pays, incentive pays and bonuses. These are paid to service members in more technically demanding jobs, as well as in more dangerous jobs.

In determining a single, average pay to use for each enlisted pay grade in this model, the median pay level for each grade was used. This is similar to how officer pay was determined for each rank. Within that pay grade, the pay for the higher and lower spine was computed using a weighted average. Because the basic structure of the Armenian Army PKB is a ground combat infantry brigade with associated combat service support, there would be far fewer higher spine occupational specialties than lower spine ones. This model weights the higher spine pay at 20%, and the lower spine pay at 80% when determining the median pay for each rank. This is a realistic weighting of the number of higher versus lower spine occupational specialties within the PKB. This can be adjusted if logic changes at a later date. Since the Private and Lance Corporal ranks each had two pay grades, the pay levels used to calculate pay for those particular ranks were evenly spread across the pay levels associated with those ranks.

(3)   Pay Conversion. Once the new pay charts are set for both officer and enlisted, the base pay for each rank must be converted from British Pounds (£) into an equivalent pay for the Armenian Army in Armenian currency (AMD). The

first step is to convert the base pay from British economic purchasing power into the equivalent purchasing power in Armenia. The model accomplishes that by using purchasing power parity, which was described in the previous chapter. The IMF website provides the economic data to convert the purchasing power from the UK to Armenia (IMF, 2013). Appendix F contains the actual values used to convert the purchasing power from the UK economy to the Armenian economy. This new pay amount is still valued in British Pounds (£). It must be converted to Armenian Dram (AMD), based off of currency conversion rates, to get the new base pay amount for each officer and enlisted rank. Since currency conversions are volatile and are adjusted daily, this model uses the average currency conversion rate for the previous 12-month period. This provides a more stable, realistic conversion rate. Appendix F contains the conversion rate data.

b. Food Allowance

The food allowance portion of monetary compensation provides the service member with pay to compensate for food subsistence. This may or may not include an amount for dependents. For the model, there is no additional monetary compensation for food because it is already included in the base pay that was calculated from the British Army pay chart.

c. Housing Allowance

The housing allowance portion of monetary compensation provides the service member with pay to assist in securing housing. This may or may not include an amount for dependents. For the model, there is no additional monetary compensation for housing because it is already included in the base pay that was calculated from the British Army pay chart.

d. Special Pay

Special pays include any additional pays, above basic pay, that may be paid to a service member for performing specialized jobs, working in hazardous environments, or similar scenarios. Examples would include pay for maintaining flight status, handling of explosives or other dangerous material, or serving in a combat zone.

This model will initially not include any special pay, as there is no specific information readily available from the Armenian Armed Forces on special pay policy. Some of this already taken into account when converting from the British Army enlisted pay spines, as mentioned earlier. An arbitrary amount could be assigned for this category, based off U.S. averages per service member, but to keep the model as simple and realistic as possible, no amounts will be included.

e.   Bonuses

Bonuses are monetary compensation received upon initial or subsequent reenlistment, or for agreeing to serve a predetermined amount of time in a particular field or specialty. As with special pay, this model does not include any amounts due to lack of guidance from the Armenian Armed Forces.

f.   Other Cash Compensation

This category was included to allow the Armenian Armed Forces to easily add any other types of monetary compensation to the model in the future. Initially, there no amounts included in this category.

2.   In-kind Benefits

The next major category of military compensation is the in-kind benefits. These are non-monetary benefits provided to the service member, yet these are costs incurred by the armed services to support each service member, so they must be included in total compensation costs to ensure all costs are taken into account. For this model, the in-kind benefits are broken down into 4 separate categories: active-duty healthcare, family healthcare, education benefits, and other in-kind benefits. Again, these categories closely resemble how Western best-practice models (Angelis & McNab, 2012) would look at in-kind benefits.

a.   Active-Duty Healthcare

The active-duty healthcare costs include providing medical and dental services to the active-duty service member. This is generally the most expensive portion

of in-kind benefits, and must be recognized as such. With little information from Armenia to determine the healthcare costs, the model aligns the costs with how much the U.S. and UK spend on military healthcare.

The model calculates the active-duty healthcare cost by first using the healthcare cost per capita for active-duty U.S. military personnel, as presented in a recent study comparing active-duty and reserve force military costs (Reserve Forces Policy Board, 2013). This cost must be converted from economic purchasing power in U.S. Dollars to Armenian Dram through purchasing power parity. When looking at healthcare costs in the U.S., UK and Armenia as a percentage of GDP (The World Bank, n.d.), the UK spends about two times more on healthcare than Armenia, while the U.S. spends approximately four times as much as Armenia. This model takes that spending in national healthcare into account, and goes beyond just purchasing power parity. Since the U.S. spends approximately four times as much as Armenia, the model reduces the amount assigned to active-duty healthcare by three quarters. Since there is no data to suggest that there are any significant differences in healthcare costs for military age service members, and since modern militaries do not use rank in determining healthcare benefits, the amount calculated for active-duty healthcare will be the same amount across all ranks.

b. Family Healthcare

The family healthcare coverage is for the legal dependents of the active-duty family member, covering their medical and dental needs. The cost of this is typically covered by modern, Western militaries like the U.S. and UK. Due to lack of data from the Armenian Armed Forces on this subject, this model will not make any determinations on costs of coverage. This category will remain in the model to allow the Armenians the ability to include this cost in the future, if needed.

c. Education Benefits

This category covers any educational benefits provided to the service member or legal dependents. This may include costs for post-secondary education, technical training, or various other non-military educational programs. In the US, this would include benefits like the GI Bill and tuition assistance. No data is currently

available from the Armenians, so this model will not include any educational benefit costs; however, they can be added in the future, if needed.

d.   *Other In-kind Benefits*

Any other benefits provided to the service members can be included in this category. To keep the model as simple as possible, this category of benefits is initially not filled with any projected costs. The Armenian Armed Forces have not provided any information on how or if to include this. For future use, this may include costs for various base services, base operations support, commissaries, exchanges, and any other benefits provided to service members that the Armenians would like to allocate the costs (Angelis & McNab, 2012).

3.   Deferred Benefits

While the monetary/cash and in-kind benefits are received in the present, deferred benefits are received sometime in the future. In dealing with military compensation, retirement benefits are those received at some point in the future, and like current compensation, usually consist of both monetary/cash and in-kind benefits. In this model, deferred benefits include: 1) retired pay, 2) retired healthcare, 3) retired housing assistance, and 4) other retired benefits. These costs are often overlooked, under estimated or even ignored when comparing various costs. This LCC model accounts for these deferred benefits when determining the overall cost of various options.

As the Armenians move to the Western model, the main cost driver for deferred benefits will become retired pay. Since they have not adopted these new deferred benefits yet, this model will include many assumptions for the deferred benefits. In determining those service members that qualify for retirement benefits, the model will incorporate the same criteria used in the U.S. model. For officers, only those that attain the rank of O-4 and higher will be able to stay to at least 20 years of service and be eligible for retirement benefits. For enlisted soldiers, those that attain the rank of E-6 or higher will be able to serve for at least 20 years and draw retirement benefits.

a.   *Retired Pay*

In order to keep the model as simple as possible, the retired pay benefit is more closely related to how U.S. military retirement is calculated, as compared to the UK model. The model uses the final pay at year 20, and multiplies that by 30% to determine the annual retired pay amount for each year in retirement. No yearly increases for inflation are included since constant dollars are used in the model. Since this model is based on the UK model of active duty pay, which combines all base pay, food and housing into one base pay category, the 30% figure represents a close approximation in how retired pay is calculated under the U.S. military retirement system, which starts with 50% of just base pay.

b.   *Retired Healthcare*

Similar to the U.S. model, this will cover some of the costs of medical and dental coverage for the retired service member and legal dependents. The calculations used for determining the cost for this category are similar to those used in determining the active duty healthcare. The starting point is the cost per capita for retired military healthcare, as determined by the same study cited in the active duty healthcare section (Reserve Forces Policy Board, 2013). This is then multiplied by the PPP, and then the currency conversion rate. It is divided by a factor of four, for the same reason as the active-duty healthcare conversion cost, to arrive at the cost used in the model. This cost only covers the service member. A factor could be added in to account for the cost of covering legal dependents, but this model does not include that at this time.

c.   *Retired Housing Assistance*

To offer the ability to look at costs from the legacy soviet compensation model, this model includes a category to account for any housing benefits provided to service members in retirement (Pan, 2009). In helping compare costs, this model assumes a one-time housing benefit will be paid to the service member at retirement, equal to 10% of annual retired pay. This one-time payment is then annualized across the 20-year retirement portion of the LCC model, using a 3% discount rate. This amount could just as easily be the value of a house or apartment provided as the only retirement benefit.

d. *Other Retired Benefits*

This category was placed into the model to allow the Armenians to easily add any other retirement benefits at a later date. This model will initially not include any specific benefits in this category.

The core of this model is the total compensation breakdown for each rank, both officer and enlisted. Compensation was divided into monetary/cash and in-kind benefits, and also between current and deferred. With an understanding of the actual compensation, the next section explains the actual user inputs to the model.

D. INPUTS TO UNIT MODEL

As with many parts of this model, Armenian guidance and inputs for the model have been very limited. After receiving the basic manning and structure of the Armenian Army's 12th PKB (Major Aaron Cummings (USA), 2013), it made more sense to build the model off of rank structure instead of unit structure. The Armenians were not able to provide enough fidelity on specific unit structures, and that would have made the model itself difficult to organize. The ability to input all the various ranks allows the user an infinite amount of flexibility in creating or adjusting manning levels for military units of any size.

The user input to the model was designed to be very simple and intuitive to use (see Appendix H). The model allows the user to input the number of personnel at each rank, and then uses those numbers to propagate the model. The input controls can be defined along a certain range, which ensures the user can only input numbers within a realistic range.

To allow some flexibility for future changes to the model, an additional section allows the user to change the mix of ranks at any time during the 20-year life cycle of the PKB (see Appendix I). Those changes would take place in the year the user designates, and then carry-forward those changes throughout the remaining 20-year life cycle.

Further adjustments to the inputs for the total compensation categories (monetary, in-kind, and deferred) can also be changed at any point in the future, but require someone

with knowledge of the model's structure to insert those changes within the formulas inside the model. These would be separate from the end-users inputs.

E. COMPUTING THE LCC OF THE PKB

Once the user has input the number of service members at each rank, and any changes to manning at any point in the 20-year active portion of the PKB, the model will provide the total life cycle costs to support that manning level. The model presents the total costs for each rank and each year during the active-duty 20-year period of the PKB (see Appendices J &K). The total retirement costs are also shown, broken down by rank for each year of the 20 years of retirement benefits (see Appendix L). There is no inflation or cost of living adjustment factored into the model.

F. INDIVIDUAL MODEL–ANNUALIZED COST OVER A CAREER

A second model is included, which builds off the total compensation, by rank, used in the main model. Where the main model focuses on LCC of the unit itself, this secondary model focuses on the total costs of a soldier or officer as he progresses throughout his career. The key difference is that it includes the deferred retirement costs annualized into each year of active duty, to gain a true sense of the total cost attributed to each soldier and officer. The intent is no provide another tool to compare total costs across different ranks.

The model assumes a 20-year career on active duty. There is a model to correspond to an enlisted career path, and then one to correspond to an officer career path. The model attempts to follow a similar promotion timeline as the British Army, with any gaps or ambiguity being smoothed out by how the U.S. military system promotes, in general.

1. Inputs to the Individual Model

The inputs are, again, simple and intuitive. Whether the enlisted or officer career path is selected, there are three user inputs (see Appendix M):

- Rank at retirement- the inputs are limited to E-6 through E-9 for enlisted, and O-4 through O-7 for officers, the same retirement criteria used in the main model.

- Years of payments in retirement- the user can select how many years of retirement payments to use to determine the deferred costs accrued during active service. By allowing the user to adjust this, different scenarios can be modeled. For instance, the user could use a expected life span in retirement to determine the years of payments, or it could be based off just a set a number of years.

- Discount rate for calculating payments- this rate is used for determining the value of the retirement annuity, which is then used to determine the annual deferred costs to be included during the active duty years.

2.   The Individual Model

Whether enlisted or officer, the model calculates the costs the same way. The model follows the promotion timeline for the enlisted or officer career path, until it reaches the rank that was input by the user as the rank a retirement. That rank is then used the remaining years until reaching 20 years of active service. The model uses the monetary/cash and in-kind benefits from the total compensation, by rank, determined from the main LCC model, for each year, based upon the rank at that year (see Appendix N).

The model then determines the total value of those benefits at the year of retirement. The pay and benefits received in year 20 are the basis for determining retirement pay. The years of retirement pay, and the discount rate, are input by the user on the front-end of the model. The total value of those yearly annuity payments are discounted to the date of retirement, to provide the present value of all retirement benefits, at the start of military retirement.

That lump sum benefit, at the end of year 20, is then annuitized over each of the previous 20 years of active duty, based on the discount rate initially entered by the user. This provides an annual cost of deferred compensation, which is then included with all the current pays and benefits, to get a total compensation cost for each of those 20 years of active service (see Appendix O). This look at total annual compensation costs provides realistic total costs to use for budgeting purposes.

VI.   IMPLICATIONS FOR THE ARMENIAN ARMED FORCES

Now that the life cycle cost LCC model is constructed, the Armenian Army can explore various cost scenarios by manipulating the model. This chapter will look at the total LCCs under their current personnel end strength and rank structure. Then the model will show the costs as the rank structure is optimized, and again after the peacekeeping brigade PKB reaches its recommended end strength. Finally, a sensitivity analysis will look at how costs are affected by a change in the retirement pay calculation, as well as a change in the retirement benefit itself.

A.   COSTS UNDER CURRENT SYSTEM

The data available from the Armenian army has been minimal. The current breakdown of personnel, by rank grouping, for the PKB is: 200 officers, 80 warrant officers and 200 sergeants and below (Major Aaron Cummings (USA), 2013). This is very similar to the old Soviet military rank structure model. Even the modern-day Russian Army has maintained a personnel structure where 25-33% of the total force are officers (Weitz, 2010).

Unfortunately, there is no further breakdown of personnel, by rank, available. For the model, assumptions on the actual mix of ranks was made based on the actual unit structure for the PKB (see Figure 3), an officer-heavy rank structure like the old Soviet model, and how those type of units would be manned based on a Western model. The total LCCs, in constant 2013 Armenian Dram (AMD), for manning the PKB at the current mix of 480 personnel are estimated at 40,066,514,120 AMD (see Table 1).

BRIGADE STRUCTURE

BDE COMMANDER

INFANTRY BN

MECH INF BN

CSS BN

RECCY COY · SIGNAL COY · ENG COY · MORT BATTERY 120mm · Anti Tank COY · MP COY · Air Def PLATOON · CBRN PLATOON · SIGNAL PLATOON

ENGLISH LANGUAGE TRAINING CENTRE · MILITARY ORCHESTRA · STORES

BRIGADE HQ STRUCTURE

Chief of staff

G-1 PERS · G-2 INTEL · G-3 OPS · G-4 LOG · G-6 CIS · G-7 TR & EX · G-8 FINANCE

ART · ENG · CBRN · AIR DEF · CIMIC · MEDICAL · ADMIN · POSTAL

Figure 3.   Armenian PKB Force Structure (from Major Aaron Cummings [USA], 2013)

	Initial Staffing					
	Officer Staffing				**Enlisted Staffing**	
	Brigadier (O-7)	1			Bn/Rgt NCO (E-9)	20
	Colonel (O-6)	2			Company NCO (E-8)	60
	Lieutenant Colonel (O-5)	10			Company Sergeant (E-7)	10
	Major (O-4)	30			Platoon NCO (E-6)	10
	Captain (O-3)	57			Corporal (E-5)	25
	Lieutenant (O-2)	60			Lance Corporal (E-4)	30
	2nd Lieutenant (O-1)	40			Lance Corporal (E-3)	75
	Total Officer =	**200**			Private (E-2)	25
					Private (E-1)	25
					Total Enlisted =	**280**
	Total Manning =	**480**				

OVERALL ACTIVE DUTY TOTAL:	35,625,033,885		OVERALL RETIREMENT TOTAL:	4,441,480,235	
	(AMD)			(AMD)	
			TOTAL LIFE CYCLE COST FOR BRIGADE:		40,066,514,120

Table 1.   Current Armenian Army PKB Staffing Level and Costs (in constant 2013 ADM)

B.   COSTS UNDER RECOMMENDED STRUCTURE CHANGES

The next analysis estimates the LCCs for two different scenarios: 1) maintaining the 480 total end strength, but optimizing the mix of ranks, and then 2) increasing the end strength to a desirable staffing level for a brigade of this nature, while maintaining a desirable mix of ranks. The first scenario looks to reduce total LCCs by using a Western

model for staffing the PKB. The second scenario increases total LCCs because of the increase in overall end strength, which supports Armenia's strategic goals of supporting NATO.

1.   Change in Rank Mix

If the Armenian Army cannot afford to increase the staffing level of the PKB, then it can at least optimize the mix of ranks to achieve some cost savings. The current staffing of 480 total soldiers is more comparable to a battalion-size unit, not a brigade (from NATO standards). The total current officer structure (200) equals 42% of the total end strength of the PKB. This if far too many officers for this size of deployable ground unit. In the US military, for perspective, the officer corps makes up 17.25% of the entire US Army, and only 10.9% of the entire USMC (Office of the Deputy Under Secretary of Defense (Military & Community and Family Policy), 2012). It would be more appropriate to model this unit after an infantry battalion, whose officer structure is even smaller than the serviced-wide officer structure noted above, usually only about 5-6% of the total unit structure (USMC, 1998).

The recommended rank structure breakdown would be 30 officers and 450 enlisted (see Table 2). This starkly contrasts the current 200 officers and 280 enlisted (including warrant officers) PKB staffing structure. The Armenian Army is staffed too heavily with officers and would need to cut a large portion of those officers, either reassigning them or separating them. Either option would probably cause problems with unit and individual morale, as well as additional costs in transferring and separating those affected officers.

The change in rank mix would cause a shift toward more lower ranking soldiers and officers within the PKB. Having more lower ranking soldiers would reduce pay and benefit costs for the Armenian Army. This would translate into an estimated total LCC, over the 40-year period, for the PKB of 29,463,021,134 AMD. This would provide the Armenians a savings of almost 10.6 billion AMD over the 40-year life of the PKB, about a 25% reduction in total costs. All costs are above are in constant 2013 AMD.

Initial Staffing						
Officer Staffing				**Enlisted Staffing**		
Brigadier (O-7)	0			Bn/Rgt NCO (E-9)	2	
Colonel (O-6)	0			Company NCO (E-8)	8	
Lieutenant Colonel (O-5)	1			Company Sergeant (E-7)	20	
Major (O-4)	3			Platoon NCO (E-6)	30	
Captain (O-3)	7			Corporal (E-5)	40	
Lieutenant (O-2)	10			Lance Corporal (E-4)	70	
2nd Lieutenant (O-1)	9			Lance Corporal (E-3)	180	
Total Officer =	**30**			Private (E-2)	70	
				Private (E-1)	30	
				Total Enlisted =	**450**	
Total Manning =	**480**					

OVERALL ACTIVE DUTY TOTAL:	27,822,240,026		OVERALL RETIREMENT TOTAL:	1,640,781,108	
	(AMD)			(AMD)	
			TOTAL LIFE CYCLE COST FOR BRIGADE:	**29,463,021,134**	

Table 2.   Recommended Rank Structure and Cost (in constant 2013 ADM) for
Current Armenian Army PKB Staffing Level

2.   Change in Size and Rank Mix

The current personnel end strength of the PKB is well below the size of typical infantry brigade, whether you look at the old Soviet model or a current Western model. In a Western model, an infantry brigade is typically commanded by a Brigadier (O-7) or Colonel (O-6). The infantry brigade generally numbers between 3000-5000 in both the

US and UK military. In fact, NATO has modeled its response force off the structure of the USMC Marine Expeditionary Brigade (MEB) (Mihalka, 2005). Since Armenia is trying to mold the PKB to fit the NATO standard, it is appropriate to use the US model as a goal.

Since the PKB is currently only staffed with 480 soldiers and officers, a more realistic staffing goal would be at the bottom end of the range for a size of a typical infantry brigade, which would be approximately 3000 soldiers and officers. With this larger size, it now becomes appropriate to staff the PKB with a brigade headquarters element. This will bring the overall size of the officers within the PKB to almost 7%, up from just over 6% under the initial staffing structure.

The recommended mix becomes 200 officers and 2800 enlisted (see Table 3). This should support a structure of two-three infantry battalions, one combat service support battalion, and one headquarters battalion. This mix would allow the Armenian Army to keep its current PKB officer staffing level (200) and not have to reassign or separate any of them. They can then either transfer in or recruit/conscript the additional soldiers needed.

The total 40-year LCC to staff the PKB under this scenario is 187,137,059,859 AMD, in constant 2013 AMD. This will undoubtedly pose a fiscal challenge for the Armenian Army, as the current estimated LCCs for the PKB are only just over 40 billion AMD, an increase of well over four-fold. The Armenian MOD will have to determine whether the increased costs are worth the additional non-monetary strategic benefits of:

- increased interoperability with NATO.
- stronger relationships with NATO countries and NATO partner nations.
- furthering their national security objectives, within the context of the their recent SDR.

To phase-in the costs, the PKB could gradually increase the size of the PKB over time.

Initial Staffing					
Officer Staffing			**Enlisted Staffing**		
Brigadier (O-7)	1		Bn/Rgt NCO (E-9)	13	
Colonel (O-6)	3		Company NCO (E-8)	48	
Lieutenant Colonel (O-5)	11		Company Sergeant (E-7)	125	
Major (O-4)	35		Platoon NCO (E-6)	190	
Captain (O-3)	40		Corporal (E-5)	250	
Lieutenant (O-2)	60		Lance Corporal (E-4)	450	
2nd Lieutenant (O-1)	50		Lance Corporal (E-3)	1100	
Total Officer =	**200**		Private (E-2)	440	
			Private (E-1)	184	
			Total Enlisted =	**2800**	
Total Manning =	**3000**				

OVERALL ACTIVE DUTY TOTAL:	175,818,686,539		OVERALL RETIREMENT TOTAL:	11,318,373,320
	(AMD)			(AMD)
			TOTAL LIFE CYCLE COST FOR BRIGADE:	187,137,059,859

Table 3.   Recommended Rank Structure and Cost (in constant 2013 ADM) for Full-Strength Armenian Army PKB Staffing Level

C.   SENSITIVITY ANALYSIS

1.   Change in Retirement Pay Calculation

The LCC model calculates retirement as 30% of active-duty pay. As mentioned in the previous chapter, this model comes close to the US military model for retirement pay calculations, which starts at 50% of base pay (not including housing and food allowance)

at 20 years of service. If the Armenians are unable to afford this amount, or think it is too generous, they can lower the retirement factor in the model to reduce overall retirement costs.

This analysis is based off the recommended structure of 3000 personnel. If the retirement factor is reduced from 30% to 20 % of active-duty pay, the total savings over the 40-year life of the PKB would be almost 3.5 billion AMD (see Table 4). This amounts to a 30% savings in retirement benefits, but only a 2% savings in overall costs, as the majority of costs are the active-duty pay and benefits. All costs are in constant 2013 AMD.

30% Retirement Factor			
OVERALL RETIREMENT TOTAL:		11,318,373,320	
		(AMD)	
TOTAL LIFE CYCLE COST FOR BRIGADE:			187,137,059,859

20% Retirement Factor			
OVERALL RETIREMENT TOTAL:		7,893,673,759	
		(AMD)	
TOTAL LIFE CYCLE COST FOR BRIGADE:			183,712,360,298

Table 4.   Change in Retirement Factor on Costs (in constant 2013 ADM)

2.   Change in Retirement Benefit

Another part of the LCC model that can readily be adjusted is the retirement benefit itself. The second part of the model, showing the deferred retirement benefits budgeted for each year (see Appendices N and O), calculates the retirement benefits for each of the 20 years immediately following retirement. This is derived from the US model, where a service member can receive 50% of his base pay after 20 years of active-duty service. Another retirement plan option for the Armenian Army would be to tailor

the retirement benefits so that the service member receives one lump sum payment immediately upon retirement, and for simplicity sake, another lump sum payment 20 years later. This is similar to the UK military, which offers a lump sum at retirement, and then another lump sum at age 65.

For this analysis, an example for both enlisted (E-8) and officer (O-5) is compared between the two scenarios mentioned in the previous paragraph. The present value of both options is compared using the same discount rate of 4%. The second option assumes a one-time payment at retirement equal to the final year's active-duty pay, for that rank, plus another payment 20 years later, again equal to the final year's active-duty pay. It does not include the healthcare and housing assistance benefits that are part of the original retirement benefits calculation.

The total savings in retirement benefits paid to an E-8 are over 12 million AMD, while the savings for an O-5 are almost 22 million AMD (see Table 5). These costs are all discounted to the time of retirement. Under this second scenario, which would more closely resemble a UK model, retirement benefit costs could be slashed by two-thirds. The amount for each payment (at retirement and again 20 years later) was selected arbitrarily, but represents a realistic option and is intended to show how much can be saved in retirement benefit costs.

Enlisted: E8 with 20 yrs of Service			
Present Value of all Retirement Benefits @ Initial Retirement			Alternate: Present Value @ Retirement of Pmt @ Retirment and Pmt @ 20 yrs later
18,579,913			6,001,603

Officer: O5 with 20 yrs of Service			
Present Value of all Retirement Benefits @ Initial Retirement			Alternate: Present Value @ Retirement of Pmt @ Retirment and Pmt @ 20 yrs later
32,257,739			10,854,860

Table 5.　　Change in Retirement Benefit

Since the Armenian Army does not currently have a mature military retirement system, the options described above, reflecting similarities to the US and UK models, offers a starting point to further develop their retirement system. As mentioned in chapter 4, the military retirement system in a Western model must incentivize service members to make the military a career. In most current Western models, that is approximately 20 to 30 years of service. As Armenia further develops its military retirement system, it needs to determine the amount and type of incentives (pay or benefits) that allow it to meet its military personnel staffing goals, while minimizing its expenditure of financial resources on retirement benefits.

VII. CONCLUSION

This project supported the ongoing efforts of the Defense Resources Management Institute (DRMI) and U.S. European Command (EUCOM) in helping the Armenian Ministry of Defense (MOD) further develop its national security strategy (NSS). Working with the North Atlantic Treaty Organization (NATO) , the Armenian Armed Forces are moving to adapt to a more Western model for force structure, to include the development of a professional NCO Corps. This has introduced new fiscal challenges for them, as they try to standardize the Armenian Army peacekeeping brigade (PKB) with the NATO structure.

To aid the Armenian Armed Forces in the development of the PKB, this project developed a recommended professional NCO corps rank structure, which aided in furthering the move to a Western model for military manpower. This new, recommended rank structure then became the base for developing a total manpower life cycle cost (LCC) model for the Armenian Army's PKB. The LCC model provided the Armenian Army the ability to look at both the policy implications of manpower decisions, through the use of the 40-year total LCC model for the PKB, as well as the costs of budgeting, through the annualized manpower cost model.

The key conclusion drawn from this analysis is that the Armenian Army needs to reduce the size of its officer corps. Its current officer to enlisted ratio is reflective of its Soviet legacy. The current efforts to move to a more Western model of military manpower and structure will help bring the size of the officer corps down, in line with Western models. The costs saved in paying for less officers can be partially used to offset the recommended increase in enlisted staffing of the PKB, which will help to meet larger Armenian NSS objectives.

Another conclusion is that the Armenian Armed Forces need to decide on their updated military pay and benefits as soon as possible, as this will greatly affect their manpower costs. This model used many assumptions for manpower costs, and these need to be refined to develop more realistic costs for the future.

Finally, the Armenians will need to prioritize these costs to standardize the PKB with NATO among the many other strategic objectives within its NSS and recent strategic defense review (SDR). The Armenians should attempt to staff the PKB to meet the NATO PKB standard. As the model demonstrated, this will require a significant financial investment.

A.   LIMITATIONS OF THE RESEARCH

A key limitation of this research was the lack of data and information available from the Armenian Armed Forces. Numerous attempts to gain more specific data yielded only basic enlisted and officer manpower structure for the PKB, along with the basic unit composition. No pay and cost data was available from the Armenian Armed Forces. This included costs for pay, allowances, retirement benefits, and other benefits (both current and deferred). All pay and benefits in the model were based on assumptions and correlations to Western models (U.S. and U.K).

In addition to the lack of data available, the lack of communication with the Armenian Armed Forces inhibited any refining or validating of assumptions. The only communication to the Armenian Armed Forces was through the U.S. Embassy, Office of Defense Cooperation (ODC), and that was minimal. The many assumptions currently limit the realistic application of this model. Further refinements will increase the validity and usefulness of this model. Even with these limitations, this research provides the Armenian Armed Forces a reasonable framework with which to understand the concepts that make up life cycle costs.

B.   AREAS FOR FURTHER RESEARCH

This project provided a very basic framework for the Armenian Army to study LCCs. There are many opportunities within this framework to further their study of LCCs. The most viable next step would be to continue to validate the many assumptions made in this model, and continue to refine the data. This requires input and feedback from the Armenian Armed Forces. The current relationship DRMI and EUCOM have with the Armenian Armed Forces, through the U.S. Embassy's ODC in Armenia, can provide the access to those stakeholders who can help further the research objectives. By

refining the data and validating the assumptions, the model's output becomes more realistic and useful.

Once the Armenians are able to provide more realistic data and help validate the assumptions from the initial model, the model can be expanded beyond the PKB to the entire Armenian Army, and eventually their entire armed forces. Since manpower costs (pay and benefits) are very similar across the various military services, the Armenians can scale the model to accommodate the various military services relatively easily. By understanding the total LCCs for their manpower, and understanding the appropriate costs to include when budgeting over an extended period of time, the Armenians position themselves to where, if they choose, they can adopt more program budgeting techniques, similar to the best practices of the Western military models.

While the opportunities to further expand the research on the manpower model is the natural first step, further progression can take this to other programs within the Armenian Armed Forces, most notably weapons systems, vehicles and equipment. As with manpower, the key to producing viable LCC models for these other programs is collecting and storing reliable data. A central repository for cost data would provide that source. If the Armenians are able to employ the program manager concept, which is used in Western military models, this will aid in making those efforts successful.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A. ACTIVE DUTY PAY COMPENSATION

ACTIVE DUTY PAY COMPENSATION- By Rank		
		Amount (AMD)
1) Cash	Basic Pay:	
	Food:	
	Housing:	
	Special Pay:	
	Bonus:	
	Other:	
	Total Cash Compensation:	
2) In-Kind	A/D Healthcare:	
	Family Healthcare:	
	Education Benefits:	
	Other In-Kind Benefits:	
	Total In-Kind Compensation:	
3) Deferred	Retired Pay:	
	Retired Healthcare:	
	Retired Housing Assistance:	
	Other Retired Benefits:	
	Total Deferred Compensation:	
	Total Pay Compensation:	

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B. BRITISH ARMY OFFICER PAY CHART 2013–2014

Officer			
RANK	**LEVEL**		**ANNUAL**
	4	Level 5	£100,973
	3	Level 4	£100,972
	2	Level 3	£99,984
	1	Level 2	£98,992
Brigadier	OA	Level 1	£98,000
	8	Level 9	£90,302
	7	Level 8	£89,277
	6	Level 7	£88,252
	5	Level 6	£87,231
	4	Level 5	£86,210
	3	Level 4	£85,190
	2	Level 3	£84,169
	1	Level 2	£83,144
Colonel	OA	Level 1	£82,123
	8	Level 9	£78,393
	7	Level 8	£77,379
	6	Level 7	£76,365
	5	Level 6	£75,360
	4	Level 5	£71,267
	3	Level 4	£70,378
	2	Level 3	£69,488
	1	Level 2	£68,599
Lt Colonel	OA	Level 1	£67,701
	8	Level 9	£57,771
	7	Level 8	£56,576
	6	Level 7	£55,389
	5	Level 6	£54,197
	4	Level 5	£52,998
	3	Level 4	£51,811
	2	Level 3	£50,611
	1	Level 2	£49,429
Major	OA	Level 1	£48,238
	8	Level 9	£45,541
	7	Level 8	£45,024
	6	Level 7	£44,499
	5	Level 6	£43,469
	4	Level 5	£42,431
	3	Level 4	£41,401
	2	Level 3	£40,358
	1	Level 2	£39,320
Captain	OA	Level 1	£38,295
Lieutenant	4	Level 10	£33,029
2nd Lieutenant	3	Level 9	£32,240
	2	Level 8	£31,458
	1	Level 7	£30,672
	OA	Level 6	£29,882
	2Lt	Level 5	£24,861
	N/A to Army	Level 4	Not Applicable
	2Lt Gap Year Commission	Level 3	£19,009
	2Lt Gap Year Commission	Level 2	£17,441
	Off Cdt	Level 1	£15,981
	+3	Level 4	£18,149
University Cadet Entrants	+2	Level 3	£16,647
	1	Level 2	£14,853
	OA	Level 1	£12,969

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C. BRITISH ARMY ENLISTED PAY CHART 2013–2014

Enlisted			
		HIGHER SPINE	LOWER SPINE
RANK	RANGE 5	ANNUAL	ANNUAL
	Level 7	£47,220	£44,561
	Level 6	£46,509	£43,336
	Level 5	£45,694	£42,153
	Level 4	£44,892	£41,347
	Level 3	£44,081	£40,544
Warrant	Level 2	£43,336	£39,742
Officer 1	Level 1	£42,501	£38,985
	RANGE 4		
Warrant Officer 2 Levels 5 - 9 only	Level 9	£43,684	£40,023
	Level 8	£43,068	£39,138
	Level 7	£42,464	£38,638
Staff Sergeant Levels 1 - 7 only	Level 6	£41,860	£38,055
	Level 5	£40,954	£36,409
	Level 4	£40,044	£35,921
	Level 3	£39,138	£35,097
	Level 2	£38,224	£33,993
	Level 1	£37,323	£33,555
	RANGE 3		
	Level 7	£37,298	£34,452
	Level 6	£36,611	£34,192
	Level 5	£35,925	£33,050
	Level 4	£35,238	£32,211
	Level 3	£34,800	£31,888
	Level 2	£33,939	£31,106
Sergeant	Level 1	£33,083	£30,312
	RANGE 2		
	Level 7	£33,514	£30,138
	Level 6	£32,798	£29,919
	Level 5	£32,132	£29,683
	Level 4	£31,375	£29,452
	Level 3	£30,660	£29,228
	Level 2	£29,228	£27,868
Corporal	Level 1	£27,868	£26,668
	RANGE 1		
Lance Corporal Levels 5 - 9 only	Level 9	£29,228	£24,472
	Level 8	£27,868	£23,616
	Level 7	£26,668	£22,582
	Level 6	£25,498	£21,656
	Level 5	£24,315	£21,292
Private Levels 1 - 7 only	Level 4	£21,991	£20,229
	Level 3	£20,957	£18,641
	Level 2	£19,030	£18,165
	Level 1	£17,689	£17,689
New Entrant Rate			£14,286

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D. ARMENIAN ARMY OFFICER PAY CHART

				CONVERSION FROM UK TO ARMENIAN RANKS & PAY SCALES		
				OFFICER		
Recommended Rank	Pay Grade	UK Annual Pay	US $ equivalent		PPP to Armenian (£)	Converted to Armenian Currency (AMD)
Brigadier	O - 7	99,984	$154,975		16,338	10,456,576
Colonel	O - 6	86,210	$133,626		14,088	9,016,057
Lieutenant Colonel	O - 5	71,267	$110,464		11,646	7,453,280
Major	O - 4	52,998	$82,147		8,660	5,542,663
Captain	O - 3	42,431	$65,768		6,934	4,437,540
Lieutenant	O - 2	31,458	$48,760		5,141	3,289,956
2nd Lieutenant	O - 1	24,861	$38,535		4,063	2,600,025

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E. ARMENIAN ARMY ENLISTED PAY CHART

Recommended Rank	Pay Grade	UK Annual Pay	US $ equivalent		PPP to Armenian (£)	Converted to Armenian Currency (AMD)
**Battalion or higher NCO (WO1)	E- 9	42,056	$65,187		6,872	4,398,321
*Company NCO (WO2)	E- 8	39,403	$61,075		6,439	4,120,885
**Company Sergeant (Staff Sergeant)	E- 7	36,746	$56,956		6,005	3,842,946
*Platoon NCO (Sergeant)	E- 6	32,816	$50,865		5,363	3,432,021
*Squad NCO (Corporal)	E- 5	29,837	$46,247		4,876	3,120,386
Lance Corporal (Level 8)	E- 4	24,466	$37,923		3,998	2,558,757
Lance Corporal (Level 6)	E- 3	22,424	$34,758		3,664	2,345,200
Private (Level 5)	E- 2	21,897	$33,940		3,578	2,290,001
Private (Level 3)	E- 1	19,104	$29,612		3,122	1,997,965
*Ranks in red represent new Armenian Professional NCO Corps						
**Ranks in blue represent additonal ranks added to convert from UK rank structure						

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX F. CONVERSION DATA

PPP- GDP/Capita in US $$$									
		PPP Conversion Factor US to Armenian:		0.119578					
Armenia-	$6,128								
UK-	$37,502		PPP Conversion Factor UK to Armenian:		0.16341				
US-	$51,248								
Reference:	IMF Website								
	http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/weorept.aspx?sy=2013&ey=2013&scsm=1&ssd=1&sort=country&								
Date:	23-Sep-13								

Currency Exchange Rate- Using 1yr avg to get more realistic conversion									
	on 23 Sept 2013		1 yr avg						
US->Armenia	$1 = 406 դր.		$1 = 410 դր.						
UK->US	£1 = $1.60		£1 = $1.55						
UK->Armenia	£1 = 651 դր.		£1 = 640 դր.						

Healthcare Costs									
US average/capita for Acitve-Duty:		$19,000		Reference:	RFPB Study: Report FY13-02				
US average/capita for Retired:		$10,000		Reference:	RFPB Study: Report FY13-02				

% of GDP spent on Healthcare:				Reference:	http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS				
(most recent data available is 2011)									
US-	17.9%								
UK-	9.3%								
Armenia-	4.3%								
Cost Factor for conversion:		4							

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX G. ANNUAL RETIRED PAY, BY RANK

OFFICER

RETIRED PAY COMPENSATION (O-7)	Amount (AMD)
Retired Pay:	3,136,973
Retired Healthcare:	122,567
Retired Housing Assistance:	21,085
Other Retired Benefits:	
Total In-Kind Compensation:	143,653
Total Compensation:	3,280,626

RETIRED PAY COMPENSATION (O-6)	Amount (AMD)
Retired Pay:	2,704,817
Retired Healthcare:	122,567
Retired Housing Assistance:	18,181
Other Retired Benefits:	
Total In-Kind Compensation:	140,748
Total Compensation:	2,845,565

RETIRED PAY COMPENSATION (O-5)	Amount (AMD)
Retired Pay:	2,235,984
Retired Healthcare:	122,567
Retired Housing Assistance:	15,029
Other Retired Benefits:	
Total In-Kind Compensation:	137,597
Total Compensation:	2,373,581

RETIRED PAY COMPENSATION (O-4)	Amount (AMD)
Retired Pay:	1,662,799
Retired Healthcare:	122,567
Retired Housing Assistance:	11,177
Other Retired Benefits:	
Total In-Kind Compensation:	133,744
Total Compensation:	1,796,543

ENLISTED

RETIRED PAY COMPENSATION (E-9)	Amount (AMD)
Retired Pay:	1,319,496
Retired Healthcare:	122,567
Retired Housing Assistance:	8,869
Other Retired Benefits:	
Total In-Kind Compensation:	131,437
Total Compensation:	1,450,933

RETIRED PAY COMPENSATION (E-8)	Amount (AMD)
Retired Pay:	1,236,265
Retired Healthcare:	122,567
Retired Housing Assistance:	8,310
Other Retired Benefits:	
Total In-Kind Compensation:	130,877
Total Compensation:	1,367,143

RETIRED PAY COMPENSATION (E-7)	Amount (AMD)
Retired Pay:	1,152,884
Retired Healthcare:	122,567
Retired Housing Assistance:	7,749
Other Retired Benefits:	
Total In-Kind Compensation:	130,317
Total Compensation:	1,283,201

RETIRED PAY COMPENSATION (E-6)	Amount (AMD)
Retired Pay:	1,029,606
Retired Healthcare:	122,567
Retired Housing Assistance:	6,921
Other Retired Benefits:	
Total In-Kind Compensation:	129,488
Total Compensation:	1,159,094

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX H. MODEL USER IPUTS, INITIAL

Initial Staffing					
Officer Staffing			**Enlisted Staffing**		
Brigadier (O-7)	1		Bn/Rgt NCO (E-9)	10	
Colonel (O-6)	3		Company NCO (E-8)	10	
Lieutenant Colonel (O-5)	8		Company Sergeant (E-7)	10	
Major (O-4)	20		Platoon NCO (E-6)	10	
Captain (O-3)	17		Corporal (E-5)	30	
Lieutenant (O-2)	39		Lance Corporal (E-4)	100	
2nd Lieutenant (O-1)	17		Lance Corporal (E-3)	100	
Total Officer =	105		Private (E-2)	100	
			Private (E-1)	100	
			Total Enlisted =	470	
Total Manning =	575				

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX I. MODEL USER INPUTS, SUBSEQUENT

Major Structure Change- Staffing					
1)	**Are you making a structure change?**				
	☐ Yes ◉ No				2
2)	Year for Structure Change	12			
3)	Adjust Staffing levels as needed:				

Officer Staffing		**Enlisted Staffing**	
Brigadier (O-7)	2	Bn/Rgt NCO (E-9)	15
Colonel (O-6)	4	Company NCO (E-8)	20
Lieutenant Colonel (O-5)	16	Company Sergeant (E-7)	20
Major (O-4)	30	Platoon NCO (E-6)	20
Captain (O-3)	28	Corporal (E-5)	60
Lieutenant (O-2)	34	Lance Corporal (E-4)	200
2nd Lieutenant (O-1)	21	Lance Corporal (E-3)	300
Total Officer =	**135**	Private (E-2)	200
		Private (E-1)	150
		Total Enlisted =	**985**

Total Manning = 1120

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX J. OUTPUT OF LCC MODEL, 20-YEAR ACTIVE DUTY PERIOD, NO STAFFING CHANGES

Rank		Active Duty Time (Years)						Total Active Duty Costs
		1	2	3	-------->	19	20	
O-7		10,689,454	10,689,454	10,689,454		10,689,454	10,689,454	213,789,080
O-6		27,746,804	27,746,804	27,746,804		27,746,804	27,746,804	554,936,085
O-5		61,489,269	61,489,269	61,489,269		61,489,269	61,489,269	1,229,785,372
O-4		115,510,821	115,510,821	115,510,821		115,510,821	115,510,821	2,310,216,414
O-3		79,397,103	79,397,103	79,397,103		79,397,103	79,397,103	1,587,942,068
O-2		137,390,533	137,390,533	137,390,533		137,390,533	137,390,533	2,747,810,650
O-1		48,159,359	48,159,359	48,159,359		48,159,359	48,159,359	963,187,180
Officer Total / Year:		480,383,342	480,383,342	480,383,342		480,383,342	480,383,342	9,607,666,849
E-9		46,311,994	46,311,994	46,311,994		46,311,994	46,311,994	926,239,883
E-8		43,537,630	43,537,630	43,537,630		43,537,630	43,537,630	870,752,596
E-7		40,758,245	40,758,245	40,758,245		40,758,245	40,758,245	815,164,910
E-6		36,648,990	36,648,990	36,648,990		36,648,990	36,648,990	732,979,805
E-5		100,597,923	100,597,923	100,597,923		100,597,923	100,597,923	2,011,958,469
E-4		279,163,522	279,163,522	279,163,522		279,163,522	279,163,522	5,583,270,438
E-3		257,807,777	257,807,777	257,807,777		257,807,777	257,807,777	5,156,155,542
E-2		252,287,913	252,287,913	252,287,913		252,287,913	252,287,913	5,045,758,264
E-1		223,084,298	223,084,298	223,084,298		223,084,298	223,084,298	4,461,685,965
Enlisted Total / Year:	1,280,198,294	1,280,198,294	1,280,198,294		1,280,198,294	1,280,198,294	25,603,965,871	
Total Cost /Year:		1,760,581,636	1,760,581,636	1,760,581,636		1,760,581,636	1,760,581,636	
					OVERALL ACTIVE DUTY TOT			35,211,632,719
								(AMD)

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX K. OUTPUT OF LCC MODEL, 20-YEAR ACTIVE DUTY PERIOD, WITH STAFFING CHANGE @ YEAR 8

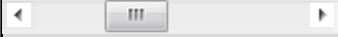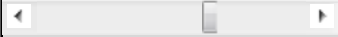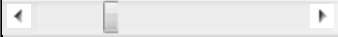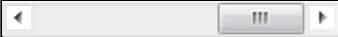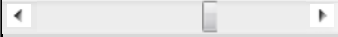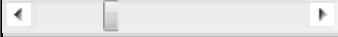| Rank		Active Duty Time (Years)						Total Active Duty Costs
		1	2	3	--------->	19	20	
O-7		10,689,454	10,689,454	10,689,454		21,378,908	21,378,908	352,751,982
O-6		27,746,804	27,746,804	27,746,804		36,995,739	36,995,739	675,172,236
O-5		61,489,269	61,489,269	61,489,269		122,978,537	122,978,537	2,029,145,864
O-4		115,510,821	115,510,821	115,510,821		173,266,231	173,266,231	3,061,036,749
O-3		79,397,103	79,397,103	79,397,103		130,771,700	130,771,700	2,255,811,820
O-2		137,390,533	137,390,533	137,390,533		119,776,362	119,776,362	2,518,826,429
O-1		48,159,359	48,159,359	48,159,359		59,490,973	59,490,973	1,110,498,160
Officer Total / Year:		480,383,342	480,383,342	480,383,342		664,658,449	664,658,449	12,003,243,240
E-9		46,311,994	46,311,994	46,311,994		69,467,991	69,467,991	1,227,267,844
E-8		43,537,630	43,537,630	43,537,630		87,075,260	87,075,260	1,436,741,783
E-7		40,758,245	40,758,245	40,758,245		81,516,491	81,516,491	1,345,022,101
E-6		36,648,990	36,648,990	36,648,990		73,297,980	73,297,980	1,209,416,678
E-5		100,597,923	100,597,923	100,597,923		201,195,847	201,195,847	3,319,731,474
E-4		279,163,522	279,163,522	279,163,522		558,327,044	558,327,044	9,212,396,222
E-3		257,807,777	257,807,777	257,807,777		773,423,331	773,423,331	11,859,157,747
E-2		252,287,913	252,287,913	252,287,913		504,575,826	504,575,826	8,325,501,136
E-1		223,084,298	223,084,298	223,084,298		334,626,447	334,626,447	5,911,733,904
Enlisted Total / Year:		1,280,198,294	1,280,198,294	1,280,198,294		2,683,506,218	2,683,506,218	43,846,968,889
Total Cost /Year:		1,760,581,636	1,760,581,636	1,760,581,636		3,348,164,667	3,348,164,667	
						OVERALL ACTIVE DUTY TO		55,850,212,129
								(AMD)

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX L. OUTPUT OF LCC MODEL, 20-YEAR RETIREMENT PERIOD

Rank		Retired Time (Years)					TOTAL RETIREMENT COSTS
		21	22	------>	39	40	
O-7		3,280,626	3,280,626		3,280,626	3,280,626	65,612,512
O-6		8,536,695	8,536,695		8,536,695	8,536,695	170,733,903
O-5		18,988,647	18,988,647		18,988,647	18,988,647	379,772,944
O-4		35,930,859	35,930,859		35,930,859	35,930,859	718,617,173
O-3							
O-2							
O-1							
Officer Total / Year:		66,736,848	66,736,849		66,736,866	66,736,867	1,334,736,531
E-9		14,509,329	14,509,329		14,509,329	14,509,329	290,186,583
E-8		13,671,425	13,671,425		13,671,425	13,671,425	273,428,508
E-7		12,832,006	12,832,006		12,832,006	12,832,006	256,640,111
E-6		11,590,943	11,590,943		11,590,943	11,590,943	231,818,856
E-5							
E-4							
E-3							
E-2							
E-1							
Enlisted Total / Year:		52,603,703	52,603,703		52,603,703	52,603,703	1,052,074,058
Total Cost /Year:		119,340,550	119,340,551		119,340,568	119,340,569	

OVERALL RETIREMENT TOTAL: 2,386,810,590

(AMD)

TOTAL LIFE CYCLE COST FOR BRIGADE: 37,598,443,309

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX M. INPUTS FOR ANNUALIZED MODEL

Inputs for Determining Total Annual Costs per Soldier:

Enlisted Career	
Rank at Retirement	E7
Years of Payments in Retirement	20
Discount Rate for Calculating all Payments	4%

Inputs for Determining Total Annual Costs per Officer:

Officer Career	
Rank at Retirement	O6
Years of Payments in Retirement	20
Discount Rate for Calculating all Payments	4%

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX N. ANNUALIZED ENLISTED MODEL (OFFICER SIMILAR)

ACTIVE DUTY PAY COMPENSATION- Enlisted			1	2	3	4	5	6	7	8
		Promotion Rate>	E1		E2		E3	E4	E5	
1) Cash	Basic Pay:		1,997,965	1,997,965	2,290,001	2,290,001	2,345,200	2,558,757	3,120,386	3,120,386
	Food:		0	0	0	0	0	0	0	0
	Housing:		0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
	Special Pay:		0	0	0	0	0	0	0	0
	Bonus:		0	0	0	0	0	0	0	0
	Other:		0	0	0	0	0	0	0	0
	Total Cash Compensation:		1,997,965	1,997,965	2,290,001	2,290,001	2,345,200	2,558,757	3,120,386	3,120,386
			0	0	0	0	0	0	0	0
2) In-Kind	A/D Healthcare:		232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878
	Family Healthcare:		0	0	0	0	0	0	0	0
	Education Benefits:		0	0	0	0	0	0	0	0
	Other In-Kind Benefits:		0	0	0	0	0	0	0	0
	Total In-Kind Compensation:		232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878
3) Deferred	Retired Pay:		526,161	526,161	526,161	526,161	526,161	526,161	526,161	526,161
	Retired Healthcare:		55,938	55,938	55,938	55,938	55,938	55,938	55,938	55,938
	Retired Housing Assistance:		3,537	3,537	3,537	3,537	3,537	3,537	3,537	3,537
	Other Retired Benefits:		0	0	0	0	0	0	0	0
	Total Deferred Compensation:		585,636	585,636	585,636	585,636	585,636	585,636	585,636	585,636
	Total Annual Pay Compensation:		**2,816,479**	**2,816,479**	**3,108,515**	**3,108,515**	**3,163,714**	**3,377,271**	**3,938,900**	**3,938,900**

9	10	11	12	13	14	15	16	17	18	19	20
			E6			E7			E8		E9
3,120,386	3,120,386	3,120,386	3,432,021	3,432,021	3,432,021	3,842,946	3,842,946	3,842,946	3,842,946	3,842,946	3,842,946
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0		0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
3,120,386	3,120,386	3,120,386	3,432,021	3,432,021	3,432,021	3,842,946	3,842,946	3,842,946	3,842,946	3,842,946	3,842,946
0	0	0	0	0	0	0	0	0	0	0	0
232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878	232,878
526,161	526,161	526,161	526,161	526,161	526,161	526,161	526,161	526,161	526,161	526,161	526,161
55,938	55,938	55,938	55,938	55,938	55,938	55,938	55,938	55,938	55,938	55,938	55,938
3,537	3,537	3,537	3,537	3,537	3,537	3,537	3,537	3,537	3,537	3,537	3,537
0	0	0	0	0	0	0	0	0	0	0	0
585,636	585,636	585,636	585,636	585,636	585,636	585,636	585,636	585,636	585,636	585,636	585,636
3,938,900	3,938,900	3,938,900	4,250,535	4,250,535	4,250,535	4,661,461	4,661,461	4,661,461	4,661,461	4,661,461	4,661,461

APPENDIX O. ANNUALIZED ENLISTED MODEL, DEFERRED BENEFITS CALCULATIONS

20			
E9			
3,842,946			
0			
0			
0			
0			
0			
0			
3,842,946			
0			
232,878			
0			
0			
0			
	Present Value of all Retirement Benefits @ Initial Retirement		**Amount of defered compensation each year**
232,878			
526,161	15,668,069		526,161
55,938	1,665,732		55,938
3,537	105,314		3,537
0	0		0
585,636	**17,439,114**		**585,636**
4,661,461			

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

Angelis, D., & McNab, R. (2012). *Technical paper: Best practices in military compensation*. Monterey, CA: Defense Resources Management Institute, Naval Postgraduate School.

Army Pay Scales. (n.d.). *The defence suppliers directory*. Retrieved November 3, 2013, from http://www.armedforces.co.uk/armypayscales.htm

Asch, B. J., & Warner, J. T. (1994). *A theory of military compensation and personnel policy.* Santa Monica, CA: RAND.

The British Army. (2013, September 30). The British Army - Ranks. cgsmediacomma-amc-dig-shared@mod uk. Retrieved October 8, 2013, from http://www.army.mod.uk/structure/32321.aspx

Caspersen, N. (2013). The South Caucasus after Kosovo: Renewed independence hopes? *Europe-Asia Studies*, *65*(5), 929–945. doi:10.1080/09668136.2013.805959

Circular A-94 Appendix C | The White House. (2012, December). Retrieved December 4, 2013, from http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c

Cost Analysis Improvement Group. (2007, October). Operating and support cost-estimating guide. Office of the Secretary of Defense.

Cummings, Aaron (Major, USA). (2013, September 30). Manning and structure of the 12th PK Bde.

De Waal, T. (2003). *Black garden: Armenia and Azerbaijan through peace and war*. New York: New York University Press.

DFAS. (n.d.). 2013 Military Pay Table. Retrieved from http://www.dfas.mil/militarymembers/payentitlements/militarypaytables.html

EUCOM Public Affairs. (n.d.). Partnership for peace | EUCOM, stronger together. Retrieved September 18, 2013, from http://www.eucom.mil/key-activities/partnership-programs/partnership-for-peace

GAO. (2007). *Cost assessment guide- best practices for estimating and managing program costs* (No. GAO-07-1134SP). US Government Accountability Office.

Gevorkyan, A. (n.d.). National security strategy of the Republic of Armenia. Retrieved from http://www.mil.am/files/NATIONAL%20%20SECURITY%20STRATEGYeng.pdf

Giles, K. (2007, June). Pay and allowances in the Russian Armed Forces: a guidance note. Retrieved August 12, 2013, from http://www.academia.edu/929853/Pay_and_allowances_in_the_Russian_Armed_Forces_a_guidance_note

Goldberg, M. S. (2012). *Costs of military pay and benefits in the defense budget*. Washington, DC: Congressional Budget Office.

Golts, A. M., & Putnam, T. L. (2004). State militarism and its legacies: why military reform has failed in Russia. *International Security*, *29*(2), 121–158.

Gorenburg, D. (2011, December 13). New pay structure approved. *Russian military reform*. Retrieved November 5, 2013, from http://russiamil.wordpress.com/2011/12/13/new-pay-structure-approved/

IMF. (2013, October). World economic outlook database. *International Monetary Fund, world economic and financial surveys*. Retrieved October 15, 2013, from http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/index.aspx

Libaridian, G. J. (2004). *Modern Armenia: people, nation, state*. New Brunswick, N.J.: Transaction Publishers.

Mihalka, M. (2005). NATO Response Force: Rapid? Responsive? A force? *Connections: The Quarterly Journal*, *4*. Retrieved from https://natoschool.org/system/files/NATO%20Response%20Force_Rapit_Responsive_A%20Force_Michael%20MIHALKA.pdf

Ministry of Defense. (2011). Strategic defense review, The Republic of Armenia. Retrieved from http://www.mil.am/files/SDR-eng.pdf

Morale: why The Russian Army is fading away. (2013, February 28). *Strategy page*. Retrieved November 3, 2013, from http://www.strategypage.com/htmw/htmoral/articles/20130228.aspx

N. MKHRTARYAN. (n.d.). Republic of Armenia and Republic of mountainous Karabagh. Topographical. Retrieved from http://www.vidiani.com/maps/maps_of_asia/maps_of_armenia/detailed_administrative_map_of_armenia.jpg

NATO. (2007). *Methods and models for life cycle costing* (No. TR-SAS-054) (p. 226). Research and Technology Organization.

NATO Individual partnership action plans (IPAPs). (n.d.). *NATO*. Retrieved September 18, 2013, from http://www.nato.int/cps/en/natolive/topics_49290.htm

NATO Individual partnership action plan 2011-2013: Armenia. (n.d.). Retrieved from http://www.mil.am/files/IPAP-2011-2013-ENG-Declassified-1349350859-.pdf

Nichol, J. (2013). *Armenia, Azerbaijan, and Georgia: Political developments and implications for U.S. interests* (p. 60). Congressional Research Service. Retrieved from http://www.fas.org/sgp/crs/row/RL33453.pdf

Office of the Deputy Under Secretary of Defense (Military, & Community and Family Policy). (2012). *2011 Demographics report* (p. 189). Retrieved from http://www.militaryonesource.mil/12038/MOS/Reports/2011_Demographics_Report.pdf

Pan, P. (2009, May 27). Russian military fights low morale over pay and housing. Retrieved August 11, 2013, from http://seattletimes.com/html/nationworld/2009265244_russia27.html

Papazian, T. (2008). State at war, state in war: the Nagorno-Karabakh conflict and state-making in Armenia, 1991-1995. *The Journal of Power Institutions in Post-Soviet Societies. Pipss.org*, (Issue 8). Retrieved from http://pipss.revues.org/1623

Reserve Forces Policy Board. (2013). *Eliminating major gaps in DoD data on the fully-burdened and life-cycle cost of military personnel: cost elements should be mandated by policy* (No. FY13-02).

Rice, C. (1987). The party, the military, and decision authority in the Soviet Union. *World Politics*, *40*(1), 55–81. doi:10.2307/2010194

USMC. (1998, October 13). Organization of Marine Corps forces. Retrieved from http://www.marines.mil/Portals/59/Publications/MCRP%205-12D%20Organization%20of%20Marine%20Corps%20Forces.pdf

Weitz, R. (2010). *The Russian military today and tomorrow: essays in memory of Mary Fitzgerald*. Strategic Studies Institute.

Welt, C. (2013). Turkish-Armenian normalisation and the Karabakh conflict. *Perceptions*, *XVIII* (1), 207–221.

What are PPPs? (2011). Retrieved August 3, 2013, from http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/ICPEXT/0,,contentMDK:22390971~menuPK:6747859~pagePK:60002244~piPK:62002388~theSitePK:270065,00.html

The World Bank. (n.d.). Healthcare expenditure. Retrieved September 23, 2013, from http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS

The World Factbook: Armenia. (n.d.). Retrieved August 19, 2013, from https://www.cia.gov/library/publications/the-world-factbook/geos/am.html

World Map- Armenia. (n.d.). Retrieved August 19, 2013, from http://www.worldatlas.com/webimage/countrys/europe/am.htm

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California